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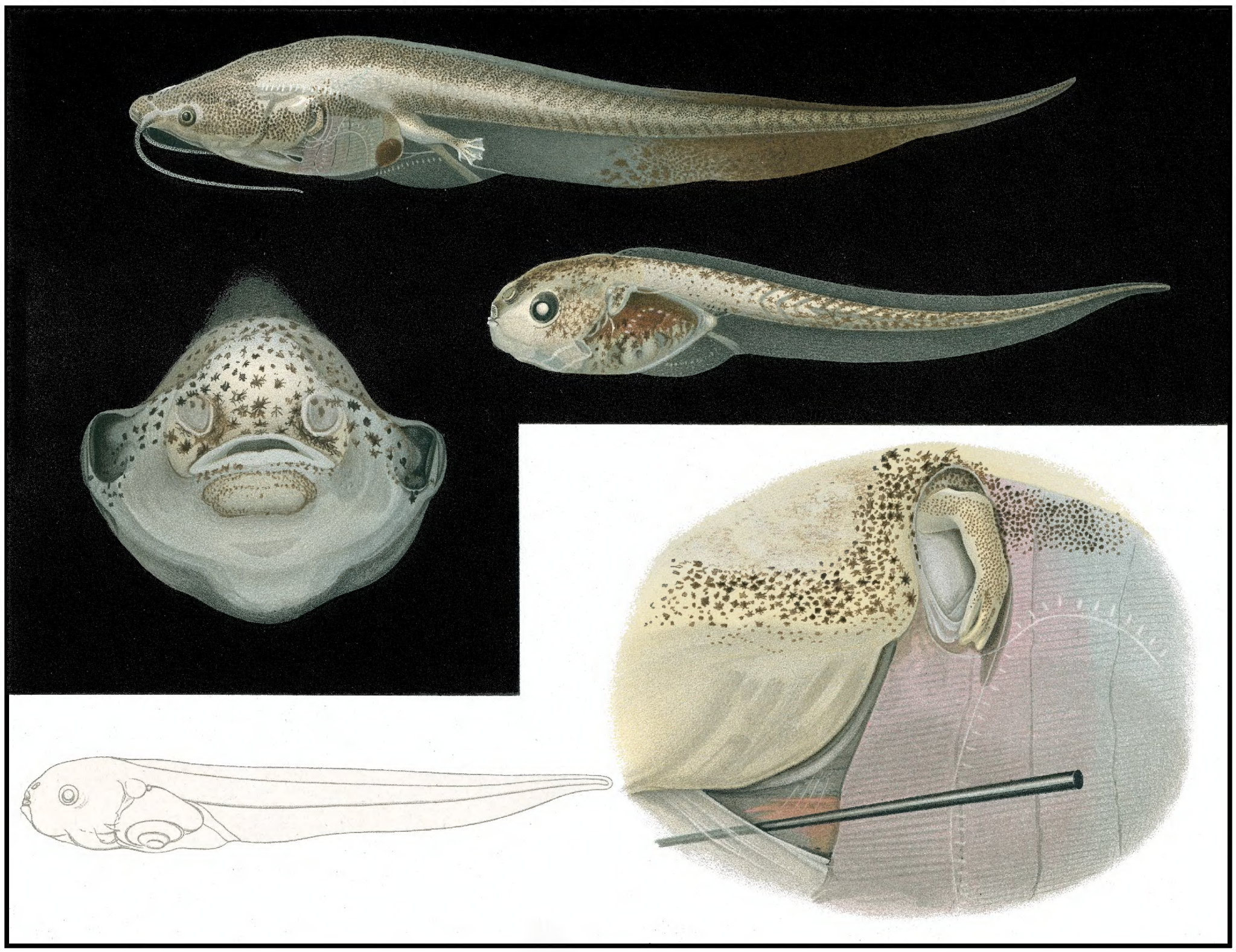

BULLETIN OF THE CHICAGO HERPETOLOGICAL SOCIETY
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Portrait of a Herpetologist as a Young Man

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"THOSE WHO CARE FOR THE STUDY OF AMPHIBIA AND REPTILES—THE HERPETOLOGISTS, TO GIVE THEM THEIR SCIENTIFIC TITLE—HAVE NEVER BEEN NUMEROUS; BUT MOST OF THEM HAVE BEEN SERIOUS STUDENTS. ONE REASON FOR THE FACT THAT THIS BRANCH OF NATURAL HISTORY IS NOT VERY POPULAR, IS A PREJUDICE AGAINST CREATURES SOME OF WHICH ARE CLAMMY AND COLD TO THE TOUCH, AND SOME OF WHICH MAY BE POISONOUS. PEOPLE WHO DELIGHT IN KEEPING NEWTS OR FROGS, TORTOISES, OR SNAKES, ARE, AS A RULE, CONSIDERED ECCENTRIC." –HANS GADOW, *AMPHIBIA AND REPTILES*, MACMILLAN, UK, 1901

Some of the vignettes in this article have been published elsewhere, but are included again here to produce continuity.

Anyone who becomes passionate about amphibians and reptiles—especially snakes—has a challenging life ahead, as these rank near the top of surveys as the most disliked creatures on the planet by humans. Since I really cannot recollect stunning stories of field experiences or terrifying encounters with herps, permit me to recall interactions with a wary public, and suggest that you, dear reader, may have had similar experiences.

When I was seven years old—reaching that so-called Age of Reason known to all parents—my mother and I were strolling down an avenue in Chicago (where I was born) whereupon I glanced into a dramatic front glass window display in a pet store. There was an artificial pond housing several adult Eastern Painted Turtles. I was thunderstruck as these were the first living chelonians I had ever seen. No animal should ever look like that! I pleaded with my mother to buy one to put into my grandparents' outdoor goldfish pond where it lived for several decades in spite of the brutal winter temperatures in the Windy City. This unforgettable episode sent me careening down a herpetological trajectory toward my eventual professional zoo career, admittedly with modest financial rewards.

I was born in 1939 to parents who had never been exposed to reptiles or amphibians. As I developed interest in these creatures for no reason discernible to them, they had a considerable period of adjustment as I filled my bedroom with aquariums and cages of all sizes and descriptions and later broadened my collection by adding more enclosures in the basement. Eventually, my family (parents and two younger sisters, Susan and Patricia) endured lizards on the curtains, snakes in the basement, crocodilians in the bathtub, minnows in the laundry room, mealworms in the refrigerator, box turtles in the fireplace, aquaria in the living room, crickets in the bedroom, aquatic turtles in the sink, salamanders in the kitchen, and frog tanks on the fireplace mantle. They learned early on that it is challenging to explain a budding herpetologist's interests to friends and acquaintances. Such interests were considered bizarre and hardly acceptable in polite society, a difficulty exacerbated when his favorite creatures chose to escape. In one instance, an adult Eastern Milksnake peeked its head out from beneath the couch cushion during my mother's tea party, causing great consternation. My parents' patience was awe-inspiring during my formative years although when my maiden aunt took my mealworms, which were nestled in bran in the fridge to avoid metamorphosis, and ate the lot believing that these were cereal, their mettle was tested.

Very early one morning, a friend and I stopped at a gas station in our Chicago suburb to fill inner tubes for a canoe trip to northern Minnesota. Soon police arrived and interrogated us at length about the reason for our presence—the officers thought that we might be casing the place. When they asked us for identification, they saw my name and shared the story that my appellation was well known throughout the village as one who kept snakes in his parents' home. In fact, they said, my name and portrait (culled from the local newspaper) with a snake picture affixed was hanging in the police station as a warning not to enter our house under any circumstance unless accompanied by one of my family. These alerts had been distributed and posted not only in the police station but also the fire station, city hall, water department, and even the power company. My parents had to read the electric meter each month and call in the results because the employees refused to enter our home.

During high school, I pestered Gene Hartz, Ed Almandarz, Marlin Perkins and Ed Maruska at Lincoln Park Zoo; Ray Pawley, Robert Snedigar and George Rabb at Brookfield Zoo; Howard Gloyd at the Chicago Academy of Sciences; and Hymen Marx at the Field Museum. All were extremely supportive despite my consistent badgering, and some became important mentors.

My parents worried about my arrested social development on all levels, and it's true that my contacts with others, even including those interested in herpetology, were exceedingly limited. In an attempt to enlarge my horizons, my parents insisted that I attend a university away from home, and so off to Xavier University in Cincinnati I went, with intentions of becoming a successful businessman as suggested by my father. Little did any of us realize that I was to meet herpetologists of such wretched design that my entire life has been irrevocably altered.

My first contact was with George McDuffie, a corpulent gentleman who was on his hands and knees, filling the hopper cars of his train set with his coin collection. As George arose to greet me, I could not help but notice that his clothing was covered with food stains and fecal matter from his sizable collection of reptiles. George was notable in many ways, for he could recite limericks for hours without repetition, each so disgusting in content that eventually the listener would run screaming from the room. No one I had ever known kept a large "pet" leech on his forearm during social gatherings as George did. George kept a collection of monstrous crocodiles, large lizards and turtles, some without legs or other vital parts. Many of these creatures were allowed to wander freely among students in the classroom

where George was a high school teacher. One of George's friends was the late Joseph T. Collins, a clean-shaven, rabid, right-wing conservative, known as one of the poorest card players in the City of Hills. Friday nights were reserved for marathon card games and on one occasion, Collins prepared a lavish pizza for one of his guests by incorporating reptilian metabolic by-products from his Burmese Python so unmentionable that I cannot describe them in polite society. Collins supplemented his meager income by swallowing various lower vertebrates (on a bet); prices were established beforehand according to grossness and inedibility.

Since the Columbus Zoo had an excellent collection, it was imperative that I meet the curator, the late Lou Pistoia. Lou was a short, hyperkinetic, cigar-smoking Italian with an imposing mustache. As an example of his love for humanity, he discovered one of his keepers (his wife) screaming in pain while lying on the floor covered with blood amidst a tray of broken rodent watering bottles. Instead of assisting her, he ranted and raved about his precious bottles that he'd had since 1939. His wife carried a tame black-and-white rat on her shoulder. As their relationship began to deteriorate, Lou would tell colleagues that "She loved that damn rat more than me!"

When we met, he spent a few hours explaining that many of his herpetological colleagues were incompetent for recommending methods for keeping reptiles successfully in captivity. "How could they dare to suggest to Lou Pistoia any technique for keeping reptiles?" he said. Holding his hands in the air, looking skyward and then looking lovingly at his hands, he screamed passionately, "These are the hands that shed the bushmaster and king cobra!"

On one visit, while Lou was showing me his new reptile building, he noticed a woman, surrounded by a group of out-of-control urchins, flicking her tongue at various ophidians, while leaving globs of saliva on the glass. Lou shouted, "Lady put your tongue back in your mouth where it belongs!" at a decibel level equivalent to a passing train.

One of his stories goes that an Egyptian cobra escaped in the rear section of the reptile building and crawled to the top of a rack of cages to eye-level, whereupon it struck him on the cheek as he was checking the collection. Fortunately, it was a "dry bite" so no venom was injected. As he explained to me, "The snake realized during the strike that his best friend was the intended victim and closed its mouth during mid-strike." He just picked up the ophidian with his hands and returned it home.

Careening madly from one experience to the next, I decided to drive to Indiana University one spring and there had occasion to meet Charlie Radcliffe, Jim Langhammer and Jim Wertz, all of whom had large private herp collections. Radcliffe was distressed because he had just suffered an automobile accident; there was only one other car in a two-acre parking lot and he had hit it. Prominently displayed in one corner of his apartment was a waist-high pile of dirty clothing that smoldered like a compost heap. Legend has it that while looking for the least offensive set of clothes to wear that day, Charlie discovered a large dried pizza in the pile . . . and speculated as to whether it might still be edible. Langhammer, meanwhile, while fondling his large, tame anaconda or reticulated python, informed me that his life was predetermined from the time he was six years old. And Wertz, with a pipe clenched in his teeth at all times, mumbled incomprehensibly that he was a "broken man" and unfit for survival in the United States – while he free-handled African vipers. He later migrated to Australia and lived naked in a rain forest growing exotic bamboo for nurseries.

Drifting through my life during these tumultuous times were various members of the so-called "Ohio Mafia." They included Kraig Adler, who was elegantly attired even then; Ray Ashton, who manifested a cherubic countenance; Corson Hirschfel (excellent photographer); Dave Dennis, co-founder with Adler of the Society for the Study of Amphibians and Reptiles (SSAR), who later became an accomplished artist and photographer; and Marty Huelsmann and Jim Corrado, co-owners with Collins of the nonprofit (vigorously so) "Ohio Valley Herpetological Laboratory" on the outskirts of Cincinnati, situated in the middle of the pasture at a sheep farm (one had to tread carefully when arriving for a visit).

Many of these personages were maintaining large living collections. Some were early members of the Ohio Herpetological Society (OHS), later to become the SSAR. They stimulated my interest in amassing a sizable array of live reptiles. Since funds were limited, I sold most of my belongings (including clothes) in order to buy more snakes.

Fellow students learned that there was a snake collection in my university dorm room. Weekly feedings were attended by an increasing number of onlookers packed into limited space to the point where a new venue was needed. Feeding times were posted in the school newspaper and hundreds gathered in the main lobby—some standing on tables, chairs and couches for a better view. As an aside, I received my alumni magazine about a year ago with a picture of a boa constrictor and discovered that the feedings were highlighted as one of the most memorable happenings in the history of the university, equal to winning a basketball championship.

For my speech class I decided that I would give a presentation about snakes, and had an adult black coachwhip quietly resting in a cloth bag at my side. My talk was punctuated by a lengthy description of the black mamba, speedy and agile, and its powerful venom. I opened the bag and my pet exploded from it into the front row of students. All shouted in primal fear and dashed madly for the three exits, including the teacher who told me later that I would receive an A+ for the class for ingenuity and sadism.

I learned firsthand about ophiophobia. When a new custodian came into my dorm room to clean, he saw the snakes, crashed through the closed wooden door with a force so strong that the entire metal door frame was dislodged and fell into the hallway with the poor fellow lying on top. He never returned to work.

I also learned that keeping a collection of live snakes is a sure way to get evicted from an apartment: I was asked to leave four dwellings during my later college days. In one case, I told the landlady beforehand that I had a reptile collection but she did not realize that snakes were reptiles. She did not see the collection until a hundred laboratory feeder mice escaped from their quarters and were running throughout the apartment. Unfortu-

nately, the landlady saw the rodents (and snakes) and threatened to call police. As she left my rooms she muttered in progressively softer tones, "No human being lives like this . . . no human being lives like this . . . no human being lives like this . . . no human being." She actually did call law enforcement when a bluegrass musician came to see her in order to rent an apartment, using my name as a reference. I had been the drummer in his band for a few months. He had bright green-dyed hair and beard, a tame raven on his shoulder, and a young lion on a leash. The police arrived soon after her phone call and I was again on the street searching for an abode.

In another instance, the landlord discovered my ophidians during an inspection in my apartment and insisted that I leave the premises in haste. I refused and was stunned when a few neighbors gathered signatures on pro-or-con petitions on snake keeping throughout the neighborhood. Unfortunately, the snake-haters won in a landslide, but I was grateful for the efforts of the snake-lovers!

Some of my turtles, lizards, amphibians, hummingbirds, honey creepers, and Neotropical tanagers (by then my interests had expanded to include exotic birds) required fruits, vegetables, insectivorous mix, and winged fruit flies. Inevitably, the insects escaped and became so prolific because of the plentiful liquefying piles of uneaten food that clouds of them filled my apartment, and then began to expand their range throughout the apartment complex. *Drosophila* biomass was so extraordinary that the rooms seemed to be in fog. After many complaints from my neighbors to the landlord, I started yet another journey to find new accommodations.

One day my friend and fellow student Bob O'Brien and I were taking his bongo drums to downtown Cincinnati to replace one of the cracked skin heads. As we walked down one of the main streets toward the music store, he began loudly banging the defective coiled skin on the intact one. This was at the end of the working day so many persons, a burly policeman, traffic and a passing bus all stopped to see what the commotion was about. Bob, quick on his feet, told the cop that his tame falcon escaped as he was carrying it to a nail salon to have its talons clipped, but that it would return upon hearing the drumbeat. A nearby reporter from *The Cincinnati Enquirer* newspaper asked if she could interview Bob. She asked the falcon's name, and Bob came up with "Mosca." Mosca is Italian for "fly," and is the name of the servant in the play *Volpone* by Ben Johnson. Only an overworked college student could have come up with it.

The reporter was quite clever and asked if the staff photographer could take our picture on top of the giant *Enquirer* sign on the skyscraper. So there we stood banging our drum and calling for the bird to return. A number of TV channels came and the whole saga lasted for over an hour. For the next few days, all media outlets called and interviewed us on the air. The whole scenario caused country-wide attention—imagine my parents' shock back in Chicago when they saw a story about their son on *The Tonight Show Starring Johnny Carson*.

A week later, a woman called me and said that our falcon was catching grasshoppers in her front yard. She sent her young son to begin banging on a sauce pan with a hammer since she

Bob O'Brien, left, Jim Murphy Have Ups and Downs

. . . but falcon wouldn't fly down to 8th Street, or up to Enquirer roof, either

Falconer Gets The Bird From Straying Falcon

The front page of the July 31, 1963, Kentucky Edition of the *Cincinnati Enquirer* prominently featured this photograph and an article about the fictional falcon.

did not have drums, but the bird ignored him. I asked her to describe the bird and it sounded like a sparrow hawk. I drove to her home and it was, in fact, a tame sparrow hawk! I threw a coat over it and released it in my bedroom.

Later Bob and I were having a leisurely drink at our favorite pub and he told the owner about our ruse: that there was no bird but one had appeared. He immediately called every newspaper, radio station and TV outlet, and so the interviews began anew.

My final move was precipitated when my elderly landlady, who owned a boarding house with many student residents, discovered an adult tame sparrow hawk flying around my room with a squeaking white mouse in its talons. She begrudgingly had accepted herps and liked birds but the last straw for her was that memorable day when she saw her soiled bed linen covered with the bird's gastrocolic waste. In my defense, I was planning on cleaning it up later. Moving heavy, cumbersome cages is no easy task, especially when my car was a tiny Volkswagen "bug." Enclosures and aquaria were strapped to the roof, causing bewildered looks from pedestrians and other drivers.

Is it any wonder then, with influences such as these described, that I returned home to my parents as a raving, bearded, callow student, with roomfuls of living reptiles, socially unacceptable, hovering precipitously on the brink of insanity, with career aspirations, of all things, toward working at a zoological garden?

Thanks to Judith Block, Bill Lamar and George Zug for multiple courtesies.

To be continued

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A Leucistic American Toad (*Anaxyrus americanus*) from Wisconsin

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Abstract

Albino and leucistic specimens of several species of toads in the family Bufonidae have been reported previously but records of albino and leucistic American toads (*Anaxyrus americanus*) remain rare. Here, we report the occurrence of a leucistic adult American toad observed in Dane County, Wisconsin in August 2020.

Coloration plays an important role in various aspects of amphibian life history. Many amphibian species have concealing, disruptive, or confusing color patterns that enhance protection against visual predators (Duellman and Trueb, 1994). Color also plays an important role in thermoregulation and provides protection from ultraviolet radiation, while communicating valuable information about sex, fitness, and availability for reproduction (Porter, 1972). A range of variation in coloration can be found in every natural population; various factors and conditions can alter the development, amount, and distribution of chromatophores (pigment-containing and light-reflecting epidermal cells). Albino and leucistic specimens have been observed for various species and life stages of amphibians (Hensley, 1959; Brame, 1962; Gilboa and Dowling, 1974; Dyrkacz, 1981; McCardle, 2012), including various toads in the family Bufonidae (Table 1). Although albino morphs have become somewhat popular in the pet trade (Figure 1), the phenomenon remains relatively rare in nature (Bechtel, 1995).

American toads (*Anaxyrus americanus*) are variably colored. In Wisconsin, American toads typically have a light tan, drab brown, reddish brown, gray, or olive-green dorsum. Dark borders encircle the warts and a light vertebral stripe is often present (Vogt, 1981). The underside is white or pale yellowish with varying amounts of gray, brown, or black spots or mottling (Vogt, 1981; Dodd, 2013). Here, we document a leucistic American toad recently observed in Dane County, Wisconsin.

At approximately 17:00 on 30 August 2020 in the village of Waunakee, one of us (AM) observed an American toad hopping across a gravel driveway near a water spigot. The yard is in a residential neighborhood next to a cornfield and across the road from an emergent marsh. American toads occur in abundance throughout the summer in this area. The observed toad was photographed and then handled briefly to move it from the driveway to a flower bed approximately 3 m (10 ft) away.

The individual was comparable in size to other toads observed in the area around the same time, with a snout–vent length measuring approximately 3.8 cm (1.5 in). It appeared to have a characteristic morphology but displayed a leucistic color pattern, with the dorsal surfaces, including the paratoid glands, uniformly lacking pigmentation (Figure 2). The eyes, however, were pigmented and the pupils appeared black with a gold ring encircling them. The belly lacked the characteristic spotting or mottling.

Most cases of albinism and leucism result from inheritance of a recessive allele that causes an enzyme deficiency that alters the metabolism of melanin during prenatal development. The condition can also be caused by factors such as temperature, nutrition, diseases, and chemical and radioactive pollution (Henle et al., 2017a, b, c). Amphibians with color abnormalities often exhibit developmental problems and many individuals do not survive to adulthood. For example, Flindt (1985) found 40% of albino European green toad (*Bufotes viridis*) tadpoles suffered from under-skin edemas, noted that several showed "misformings of the body," and commented that "strongly misshaped larvae died after a few days, the other ones before metamorphosis."

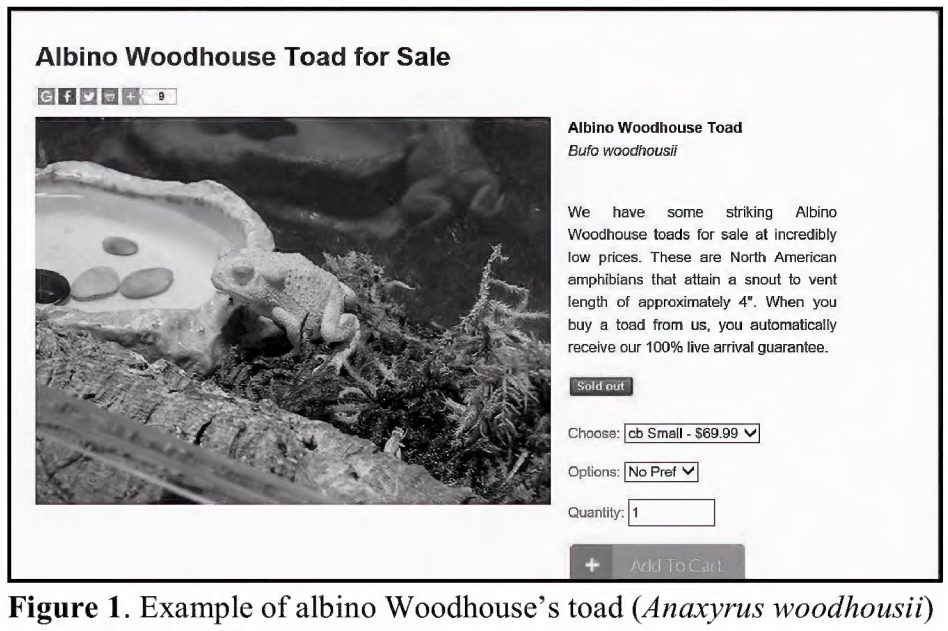
Albino Woodhouse Toad for Sale
Albino Woodhouse Toad
Bufo woodhousii
We have some striking Albino Woodhouse toads for sale at incredibly low prices. These are North American amphibians that attain a snout to vent length of approximately 4". When you buy a toad from us, you automatically receive our 100% live arrival guarantee.
Sold out
Choose: cb Small - $69.99
Options: No Pref
Quantity: 1
Add To Cart

Figure 1. Example of albino Woodhouse's toad (*Anaxyrus woodhousii*) available for sale in the pet trade.

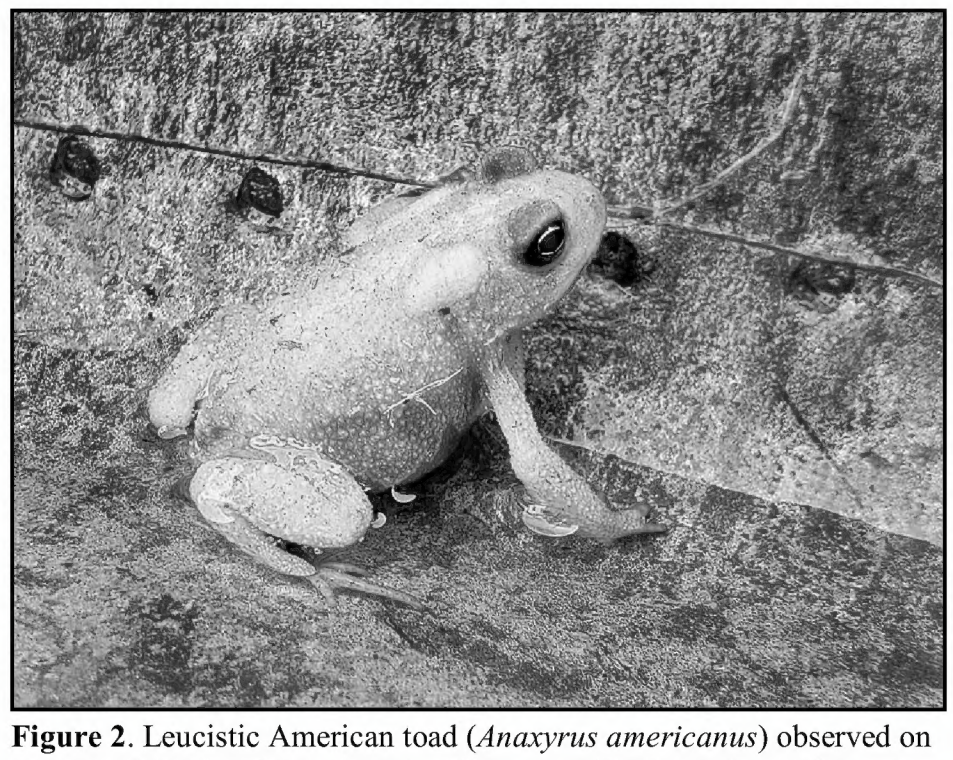

Figure 2. Leucistic American toad (*Anaxyrus americanus*) observed on 29 August 2020 in Dane County, Wisconsin. Photograph by Alexandria Mann.

Table 1. Published reports of different life stages of toads in the family Bufonidae exhibiting albinism and leucism.[1] Records are for adult toads unless otherwise indicated.

Species	Albinism (A) / Leucism (L)	Location	Reference(s)
Anaxyrus americanus	L	USA, Kentucky	Brannon (2006)
	A	USA, Michigan	Nace (1974)
(larvae)	A	USA, Missouri	Hensley (1959)
	L	USA, North Carolina	Brannon (2006); Thomas and Follum (2016)
	A	USA, Virginia	Hensley (1959); Bulmer (1975); Dyrkacz (1981)
Anaxyrus boreas	A	USA, Washington	Hensley (1959)
Anaxyrus fowleri	L	USA, North Carolina	Palmer and Braswell (1980); Brannon (2006)
Anaxyrus punctatus (larvae)	A	USA, Colorado	Luepschen (1981); Livo (2000)
Anaxyrus terrestris	L	USA, Florida	Dyrkacz (1981)
Anaxyrus woodhousii	A	USA, Louisiana	Hensley (1959)
	L	USA, North Carolina	Palmer and Braswell (1980)
(juvenile)	A	USA, North Carolina	Dyrkacz (1981)
	A	USA, Ohio	Hensley (1959)
	A	USA, Texas	Hensley (1959); Vance and Taplin (1977); Dyrkacz (1981)
Bufo bufo	L	Belgium	Verbelen and Grouw (2013)
	A	England	Richards (1983); Spooner (2006); Spooner et al. (2007)
(eggs, larvae, adults)	A	England	Pash et al. (2007)
	L	France	Muratet et al. (2010)
	A	Germany	Oerter and Kneitz (1994); Nöllert and Nöllert (1995)
(eggs)	A	Germany	Bender (1997)
	L	Germany	Thomas et al. (2002)
	A	Netherlands	in den Bosch (1990); Laar (1992)
(eggs, larvae)	A	Poland	Laskowski (2010)
	L	Poland	Kaczmarski (2018)
(eggs)	A	Spain	Ayllón (2013)
Bufotes balearicus × *Bufotes boulengeri siculus* (larvae)	L	Italy	Colliard et al. (2010)
Bufotes oblongus (larvae)	A	Kyrgyzstan	Borkin (1989)
Bufotes viridis (eggs, larvae)	A	Germany	Flindt (1985); Henle et al. (2017c)
(larvae)	L	Italy	Camerano (1889); Lunghi et al. (2017)
Epidalea calamita	A	Spain	Díaz-Paniagua et al. (2005)
(larvae)	L	Germany	Flindt and Hemmer (1969); Deichsel and Schwerdtle (1985)
Melanophryniscus montevidensis (larvae)	A	Uruguay	Maneyro and Achaval (2004)
Rhinella fernandezae	L	Argentina	López and Ghirardi (2011)
Sclerophrys arabica (larvae)	A	United Arab Emirates	Feulner (2005)

1. In addition to records published in the scientific literature, a Google search of internet and social media websites on 1 September 2020 found photographs of leucistic *Anaxyrus americanus* adults from Georgia and Missouri, leucistic *A. americanus* tadpoles from North Dakota, an albino *A. americanus* adult from Pennsylvania, albino *A. americanus* eggs and tadpoles from Ohio, leucistic *A. terrestris* adults from Florida and North Carolina, albino *A. terrestris* adults from Florida, a leucistic *A. woodhousii* adult from Kentucky, a leucistic *Bufo bufo* adult from France, albino *Bufo bufo* adults from Belgium and England, an albino *Bufo gargarizans* adult from Hong Kong, an albino *Bufotes viridis* adult from Hungary, a leucistic *Epidalea calamita* adult from Germany, and an albino *Incilius valliceps* at the San Antonio Zoo in Texas.

Pash et al. (2007) reported that once albino common toad (*Bufo bufo*) tadpoles began swimming freely, they exhibited motility problems and within a few days all died. Similarly, common toad tadpoles that hatched from albino eggs "showed a strange behavior while moving and a lack of activity," and fewer than half metamorphosed (Bender, 1997). Leucistic tadpoles resulting from crosses of male Balearic green toad (*Bufotes balearicus*) and female African green toad (*B. siculus*) exhibited various abnormalities and developmental arrest (Colliard et al., 2010). Nine of 12 albino Montevideo red-bellied toad (*Melanophryniscus montevidensis*) tadpoles died before reaching Gosner stage 30 (Maneyro and Achaval, 2004). Aside from developmental

abnormalities, underlying genetic conditions may make unusually pigmented individuals more sensitive to environmental factors or more vulnerable to predators (Childs, 1953; Bechtel, 1995; Henle et al., 2017a, b), but some aberrantly colored specimens survive to adulthood and may even reproduce.

Information on the survival of albino and leucistic adult toads is mostly unavailable, largely due to the overall rarity of the conditions. Bulmer (1975) suggested that American toads may not rely as heavily on defensive coloration and hypothesized that the chances of survival "are enhanced in [*Anaxyrus*] because of the distasteful mucous secretion of the paratoid glands combined with their nocturnal and fossorial (i.e., active at night and burrowing) habits." This may be the case, but the limited, isolated observations of this rare phenomenon unfortunately do not allow us to draw this conclusion.

Literature Cited

Ayllón, E. 2013. Primera observación de una puesta albina de *Bufo bufo* en la Península Ibérica. Boletín de la Asociación Herpetológica Española 24(1):69-70.

Bechtel, H. B. 1995. Reptile and amphibian variants: Colors, patterns, and scales. Malabar, Florida: Krieger Publishing Company.

Bender, B. 1997. Temporärer Albinismus bei der Erdkröte (*Bufo bufo*). Zeitschrift für Feldherpetologie 4(1/2):212-214.

Borkin, L. J. 1989. Über den Fund einer albinotischen Kaulquappe der tetraploiden Krötenart *Bufo danatensis* Pisanetz, 1978 aus dem Issyk-Kul' See, Kirgisien. Salamandra 25(2):122-124.

Brame, A. H., Jr. 1962. A survey of albinism in salamanders. Abhandlungen und Berichte für Naturkunde und Vorgeschichte 11(3):65-81.

Brannon, M. P. 2006. Natural history notes. *Bufo a. americanus* (Eastern American Toad). Leucism. Herpetological Review 37(3):333-334.

Bulmer, W. 1975. Albino toad from No. VA. Virginia Herpetological Society Bulletin 78:7.

Camerano, L. 1889. Di alcuni girini albini e delle cause dell'albinismo. Bollettino del Musei di Zoologia ed Anatomia Comparata Torino 4(64).

Childs, H. E., Jr. 1953. Selection by predation on albino and normal spadefoot toads. Evolution 7(3):228-233.

Colliard, C., A. Sicilia, G. F. Turrisi, M. Arculeo, N. Perrin and M. Stöck. 2010. Strong reproductive barriers in a narrow hybrid zone of West-Mediterranean green toads (*Bufo viridis* subgroup) with Plio-Pleistocene divergence. BMC Evolutionary Biology 10:232. <http://www.biomedcentral.com/1471-2148/10/232>

Deichsel, G., and C. Schwerdtle. 1985. Eine teilweise albinistische Kreuzkröte *(Bufo calamita* Laurenti, 1768) aus Biberach an der Riß (Baden-Württemberg) (Salientia, Bufonidae). Salamandra 21(4):316-317.

Díaz-Paniagua, C., C. Gómez-Rodríguez, A. Portheault and W. de Vries. 2005. Los anfibios de Doñana. Naturaleza y Parques Nacionales. Serie Técnica. Organismo Autónomo Parques Nacionales. Ministerio de Medio Ambiente.

Dodd, C. K., Jr. 2013. Frogs of the United States and Canada. Vol. 1. Baltimore: Johns Hopkins University Press.

Duellman, W. E., and L. Trueb. 1994. Biology of amphibians. Baltimore: Johns Hopkins University Press.

Dyrkacz, S. 1981. Recent instances of albinism in North American amphibians and reptiles. SSAR Herpetological Circular 11:1-31.

Feulner, G. R. 2005. Albino tadpoles of *Bufo arabicus* and their possible development. Tribulus: Journal of the Emirates Natural History Group 15(2):22-23.

Flindt, R. 1985. Latenter Albinismus und Mißbildungen bei Kaulquappen von Wechselkröten *Bufo viridis* Laurenti, 1768 (Salientia, Bufonidae). Salamandra 21(4):298-303.

Flindt, R., and H. Hemmer. 1969. Über eine weißlingslarve der kreuzkroete (*Bufo calamita*). Aqua Terra 6(4):45-48.

Gilboa, I., and H. G. Dowling. 1974. A bibliography of albinism in amphibians and reptiles, 1849–1972. HISS Publications in Herpetology 6:1-11.

Henle, K., A. Dubois and V. Vershinin. 2017a. Commented glossary, terminology and synonymies of anomalies in natural populations of amphibians. Mertensiella 25:9-48.

Henle, K., A. Dubois and V. Vershinin. 2017b. A review of anomalies in natural populations of amphibians and their potential causes. Mertensiella 25: 57-164.

Henle, K., A. Dubois, K. Rimpp and V. Vershinin. 2017c. Mass anomalies in green toads (*Bufotes viridis*) at a quarry in Roßwag, Germany: Inbred hybrids, radioactivity, or an unresolved case? Mertensiella 25:185-242.

Hensley, M. 1959. Albinism in North American amphibians and reptiles. Publications of the Museum, Michigan State University, Biological Series 1(4):133-159.

in den Bosch, H. A. J. 1990. Een albino exemplaar van de gewone pad (*Bufo bufo*). Lacerta 48(5):155-156. [In Dutch with English abstract.]

Kaczmarski, M. 2018. Częściowy albinizm czy wyjątkowo jasno ubarwiony osobnik ropuchy szarej *Bufo bufo* w Poznaniu? Wszechświat 119(7–9):196-198.

Laar, V. van. 1992. Een geval van albinisme bij de Gewone pad, *Bufo bufo*, te Amersfoort. Pp. 53-54. *In*: R. Bugter, P. Frigge, R. Krekels and H. Teunis, editors, Waarnemingen van amfibieen en reptielen in Nederland in 1991. Nijmegen, Netherlands: Stichting Reptielen Amfibieën Vissen Onderzoek Nederland (RAVON).

Laskowski, P. 2010. Ropucha szara *Bufo bufo* (Linnaeus, 1758). *In*: Herpetofauna Polski. <http://zbeok.uni.wroc.pl/herp/herp_pliki/Bb.htm>. Accessed 14 October 2020.

Livo, L. J. 2000. Natural history notes. *Bufo punctatus* (Red-spotted toad). Larval coloration. Herpetological Review 31(2):99.

López, J. A., and R. Ghirardi. 2011. First record of albinism in *Rhinella fernandezae* (Gallardo, 1957). Belgian Journal of Zoology 141(1):59-61.

Luepschen, L. K. 1981. Life history notes. *Bufo punctatus* (Red-spotted toad). Larval coloration. Herpetological Review 12(3):79.

Lunghi, E., A. Monti, A. Binda, I. Piazzi, M. Salvadori, R. Cogoni, L. A. Riefolo, C. Biancardi, S. Mezzadri, D. Avitabile, G. F. Ficetola, M. Mulargia, S. Manca, P. Blaimont, A. R. Di Cerbo and R. Manenti. 2017. Cases of albinism and leucism in amphibians in Italy: New reports. Natural History Sciences (formerly Atti della Società italiana di Scienze naturali e del Museo civico di Storia naturale in Milano) 4(1):73-80.

Maneyro, R., and F. Achaval. 2004. Natural history notes. *Melanophryniscus montevidensis* (Darwin's toad). Albino larvae. Herpetological Review 35(3):261.

McCardle, H. 2012. Albinism in wild vertebrates. M.S. thesis. San Marcos: Texas State University. 72 pp.

Muratet, J., G. Deso and J.-P. Vacher. 2010. Un cas de leucisme chez le Crapaud commun *Bufo bufo* (Linné, 1758). Bulletin de la Société Herpétologique de France 134:51-54.

Nace, G. W. 1974. Albino toad found in Michigan - continued. Herpetological Review 5(3):70.

Nöllert, A., and C. Nöllert. 1995. Los amphibios de Europa: Identificación, amenazas, protección. Barcelona: Ediciones Omega.

Oerter, K., and G. Kneitz. 1994. Zur Wirksamkeit von Ersatzlaichgewassern fur Amphibien beim Bundesfernstraßenbau. Bonn-Bad Godesberg, Germany: Forschung Straßenbau Straßenverkehrstechnik 675:3-211.

Palmer, W. M., and A. L. Braswell. 1980. Additional records of albinistic amphibians and reptiles from North Carolina. Brimleyana 3:49-52.

Pash, S., J. Spooner and J. P. Sumpter. 2007. Albino common toads (*Bufo bufo*). Herpetological Bulletin 100:8-11.

Porter, K. R. 1972. Herpetology. Philadelphia: W. B. Saunders Co.

Richards, J. 1983. Letters to the editor. International Herpetological Society Newsletter (117):1.

Spooner, J. 2006. Albino common toads - *Bufo bufo*. Journal of the Ruislip and District Natural History Society 32:22-24.

Spooner, J., S. Pash and J. P. Sumpter. 2007. Occurrence of an albino newt and albino common toads (*Bufo bufo*) in the same garden pond. Herpetological Bulletin 100:11-12.

Thomas, M. A., and S. C. Follum. 2016. Natural history notes. *Anaxyrus americanus* (American toad). Partial leucism. Herpetological Review 47(1):102-103.

Thomas, M., R. Rottscheidt and M. Hachtel. 2002. Ein Fall von Flavinismus bei Erdkröte *Bufo bufo* (Linnaeus, 1758) nahe Bonn. Salamandra 38(2):119-123.

Vance, T., and G. Taplin. 1977. Another yellow albino amphibian. Herpetological Review 8(1):4-5.

Verbelen, D., and H. van Grouw. 2013. Kleurafwijkingen bij inheemse amfibieën in Vlaanderen. Tijdschrift 15(1):8-15.

Vogt, R. C. 1981. Natural history of amphibians and reptiles of Wisconsin. Milwaukee, Wisconsin: Milwaukee Public Museum and Friends of the Museum.

The Amphibian Foundation's Master Herpetologist Certification Program

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Herpetology enthusiasts of all backgrounds, education levels, and geographical regions are invited to participate in the 16-week, 8-session Master Herpetologist Certification Program offered quarterly through the Amphibian Foundation in Atlanta, Georgia.

The intensive course introduces students to herpetology, along with amphibian and reptile conservation and biodiversity. The course is offered both online and in-person, although in-person classes have been suspended for the time being due to the COVID-19 pandemic. With more than 50 lectures, the course is taught by a diversity of herpetologists from around the world, some of whom are recent Chicago Herpetological Society guest speakers.

The online Master Herpetologist Certification Program costs $300 and includes all lectures, readings, a final exam, and, of course, a certificate. Students move at their own pace and attend the pre-uploaded lectures on their own time, with optional "office hours" offered every other Wednesday at the beginning of a new course section. Students can expect to spend 4–5 hours per week, and 8–10 hours per section, on the course material.

The course is intended for adults, but students under 18 can register with special permission. Past graduates of the program have been college and graduate students, educators, field professionals, naturalists, and herp enthusiasts of all kinds, including a few of our own CHS members and board members. Students can use the course to help build their resumes and make valuable networking connections in the field. Graduates from the program may also be offered discounts for other classes, events, and workshops through the Amphibian Foundation throughout the year, as well as opportunities for field work in research studies.

In a word, the course is awesome. I'm a "graduate" of the spring 2021 session, and now a Master Herpetologist (don't mind if I do), along with CHS Vice President Rachel Bladow, who graduated in winter 2020. I don't have an academic background in herpetology or science, so this has been a wonderful opportunity to access a program of this caliber, whereas I may not otherwise have the opportunity, resources, or time to go back to school for another degree program. I now feel more deeply connected with the herpetology community and have a greater understanding of the state of conservation and research in the field after taking the course.

I would recommend it to every herp enthusiast, including folks who may feel like they know a lot already, and folks who may feel intimidated or like they don't know enough. The course is also ideal for young people who may be interested in studying herpetology and would like to get a feel for the kind of research that's happening or still needed out there. The material is intensive, but the instructors and environment are friendly, and the assignments are achievable.

The mission of the Amphibian Foundation is "connecting individuals, communities, and organizations in order to create and implement lasting solutions to the global amphibian extinction crisis." Learn more and sign up for the next session of the Master Herpetologist Certification Program at: https://www.amphibianfoundation.org/index.php/educational/college-adult-courses/master-herper.

Minutes of the CHS Board Meeting, May 14, 2021

A virtual meeting of the CHS board of directors via Zoom conference video/call was called to order at 7:35 P.M. Board member John Gutierrez was absent. Nonmembers of the board in attendance were Zorina Banas and Joan Moore. Minutes of the April 16 board meeting were read and accepted.

Officers' reports

Treasurer: Rich Crowley went over the April financial report.

Media secretary: Stephanie Dochterman reported that we need to focus on "clickable" content for social media. We need more interaction with our followers. The CHS YouTube channel is up and running. We need content!!!

Membership secretary: Mike Dloogatch reported that membership showed a slight rise, thanks to several late renewals.

Sergeant-at-arms: Tom Mikosz reported that 29 people had logged in for the April online meeting plus three watching live on Facebook. The following day we had over 100 views.

Committee reports

Adoptions: Zorina Banas invited all to check out the new Adoptions Facebook page. She is working on Adoptions/Fostering/Relinquishing guidelines and forms.

New business

John Archer reported that he is still looking for a chairperson for the Nominating Committee; most current members are willing to serve again. We are still on hold for in-person meetings; future meetings may be a mix of in-person / online / live-streaming. The Peggy Notebaert Nature Museum is not expected to open until September.

The meeting adjourned at 8:40 P.M.

Respectfully submitted by recording secretary Gail Oomens

Bulletin of the Chicago Herpetological Society 56(6):93-107, 2021

Some Fun Observations of Gophersnakes (*Pituophis catenifer*) Near Tucson, Arizona—Part 3

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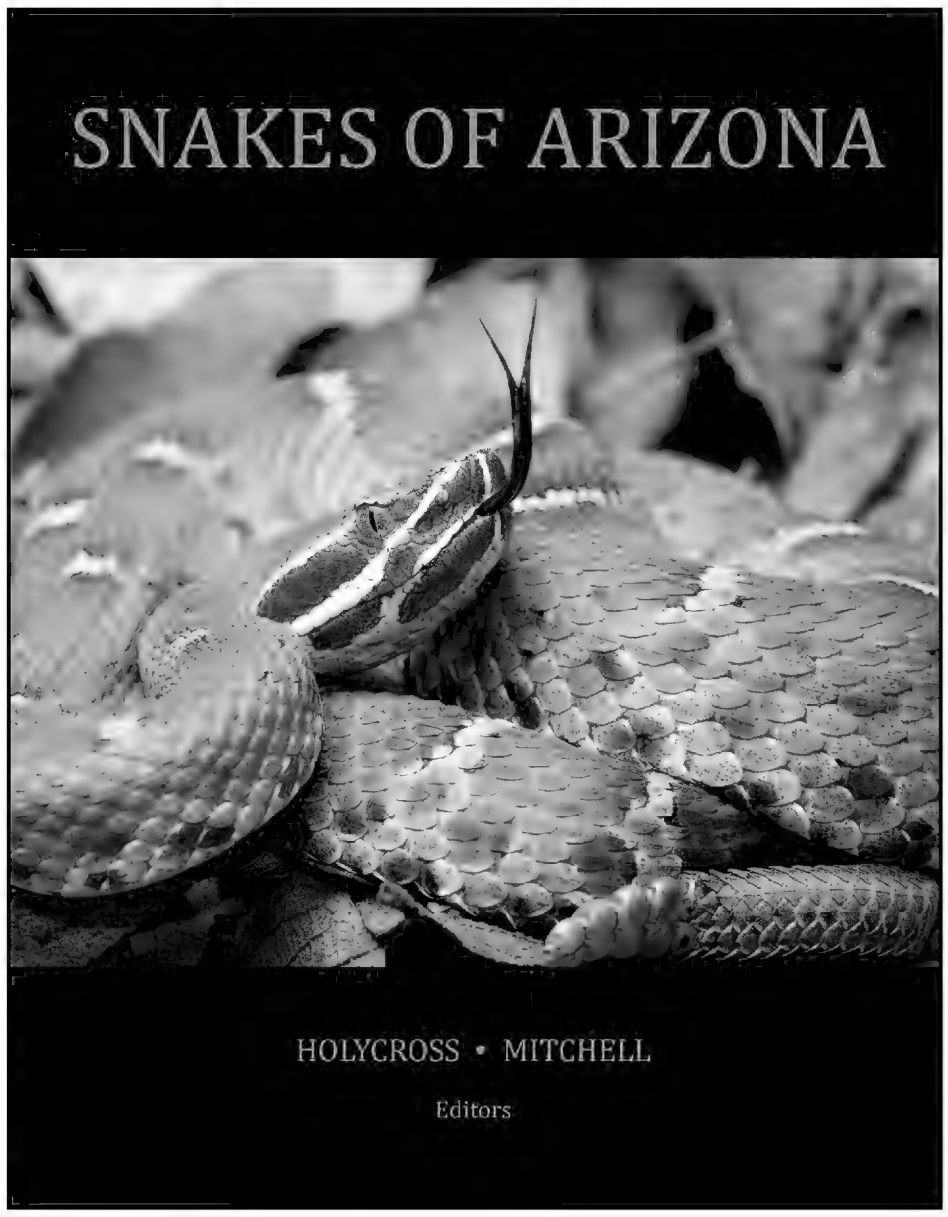
Dedicated to the legendary man of science who "got 'er done," Dr. Joe Mitchell. 16 August 1949 – 2 July 2019

Well, this is a *fine* mess that I have gotten myself into! On 15 March of this year, I *finally* decided what the topic of my column for the April *Bulletin of the Chicago Herpetological Society* would be. I would write about Gophersnakes. My initial intent was to put together a short column with some cool observations about them, and augment those observations with the newest information available. Said newest information would be gleaned from the Gophersnake account (Babb et al., 2020), in the recently published book *Snakes of Arizona* (Holycross and Mitchell, 2020). At that point in time, I had 16 days to accomplish this. Since many observations that I had were memories of photos taken by others, there were many emails that I sent to solicit images from them. When one sends an email asking for help from a fellow herpetologist, my tattered copy of *Emily Post for the Discerning Herpetologist* (Nightly, I. P., 2005) reminds me that the high-tech leg-humping *should* contain more than the words "Hello! Send me your pictures!" That becomes especially true if one hasn't thanked yet for a previous favor performed by the mark . . . er, uh . . . friend of whom is asking the new favor. In such cases, one must not only suck up for the current favor being requested, but also feloniously suck up for past kindnesses performed as well. On top of that, one must feign great interest for any unrelated, *dreary* side topic that might come up. What is *especially* annoying is when the friend asks a favor in return. I don't even have time for me! How dare they bother me with their trivial bullshit? In the end, it usually takes at least three fawning emails for every image not taken by yours truly that appears in one of these columns. In short, I often spend more time begging for images than I do writing the actual columns!



The words above, as well the words in this paragraph, were written on 16 May 2021. I am two months and one day into an article that continues to develop into something well beyond what I originally intended. A scant two days ago, I learned that even though we have grown well outside the boundary of the two words "near Tucson" in the title of this ever-evolving work, it would be improper of me to remove that "near Tucson." Yes, it was all explained proper to me. If we change the title now, every fire alarm in the nation will be tripped, drawbridges will rise above every moat, and the crocodiles and piranhas will be released. Hence, we are stuck with this title, even though Part 3 has little to do with Gophersnakes near Tucson. Hell no! We will be heading from New Jersey to Wisconsin and beyond with this particular column. This has taught me to be careful in creating column titles, for it appears that I must hang them around my neck like some dead chicken that I have been caught stealing. But I *suppose* a different tactic to deal with the increasingly divergent title and subject matter should be used here. I *could* meekly say that New Jersey is "near Tucson" if one is judging distance from China.

18 May 2021: At this point in time, Andrew T. Holycross and Randall D. Babb are in possession of Parts 1 and 2 of this series of columns. Andy Holycross is the first editor of the recently-published book *Snakes of Arizona*. Randy Babb is the lead author of the Gophersnake account that resides in *Snakes of Arizona*. The three of us have been on friendly terms since the mid-1990s. I hope we can keep it that way! Andy 'n' Randy had no idea that I was writing these columns until Part 2 was in the final stages of editing. As a courtesy to them both, I fired them an email explaining what I was doing. This email proved to be one of those rare wise moves that this author occasionally comes up with by accident. However, there was definitely room for improvement with the wording of this email from me to them. Any "attaboys" that might have been earned by contacting them ahead of time were tarnished when my words took on a somewhat contentious tone. I told them I was all butt-hurt that I was not given the opportunity to review this Gophersnake account of theirs prior to publication. As if that wasn't enough, I next went after Randy. I went so far as to say that Mr. Babb ignored me while writing this account. (Did he *really* ignore Roger Repp—the Herp King of Southern Arizona? Yes, he did!). He also ignored some of the other veritable herpetological whales amongst minnows who reside in Southern Arizona. In my opinion, we were treated like sluts in a convent by Mr. Babb. Those were not my exact words (the words of I. P. Nightly [op. cit.] discourage one from that sort of dialog), but

that notion was implied.

Their responses to my ill-conceived and poorly-executed email were thoughtful, and more kind than they should have been. Randy turned the tables on me by asking how many herpetological heavy-hitters from central and northern Arizona I had included in *my* articles. (Ouch! Zero!) Andy appropriately zinged me even *more* by suggesting that I was given every opportunity to author some accounts in the early going of the book. When I turned him down, he correctly assumed that my interest was low. Andy went on to explain that their objective in publishing *Snakes of Arizona* was not necessarily to write about snakes of Arizona, but rather, to provide "a synthesis of the literature . . . sprinkled with unpublished observations as they were aware of them." (They *certainly* did a *lot* of that). But the question that Andy asked of me in his reply that I had no *immediate* response for was as follows: "What is your objective in writing this Gophersnake chapter review?" Uh, objective? He would have enjoyed the dumb look that this question produced, but dumb looks must be seen to be appreciated. Truth be told, I missed the opportunity to suggest my *real* objective for writing the first two pieces. Said objective is right in the title: "Some fun observations . . . " That's right—I am doing all this to have *fun*! To be sure, I am hopeful that some of my/our observations will eventually land in a revised edition of *Snakes of Arizona*. (Which we can safely say will *not* happen in my lifetime.) Now that I have had time to think about this "what's-my-objective?" business, I can definitively say that I/we are *augmenting* the Gophersnake species account in *Snakes of Arizona* with our information. Also, I have a highly competitive side to my nature, and part of my objective was to compete with Andy and Randy over who had the most and best observations about our local Gophersnakes. Knowing now that *their* objective was mainly a summary of literature dilutes (but does not defeat) the purpose of the competitive aspects of these columns. But in the end, as with the rest of what I am saying and have said, I did and am doing this to have fun. And I *will* have fun with this comparative review regardless of any other objectives—theirs *or* mine.

To avoid throwing *endless* sentence-by-sentence citations of what Holycross and Mitchell, or Babb, Boyarski and Mitchell have to say in the review that follows, I will give a full citation of each here:

Holycross, A. C., and J. T. Mitchell, editors. 2020. Snakes of Arizona. Rodeo, New Mexico: ECO Publishing. 836 pages.

Babb, R., V. Boyarski and J. Mitchell. 2020. *Pituophis catenifer* Gophersnake. Pp 302-317. *In*: A. C. Holycross and J. T. Mitchell, editors, Snakes of Arizona. Rodeo New Mexico: ECO Publishing.

Moving forward, *Snakes of Arizona* will often be shortened to *SoA.* We start doing that right now. The back side of the third turn of the page of *SoA* has this to say about copyright issues: "All rights reserved. No part of this book may be reproduced or transmitted in any form without permission in writing from Andrew T. Holycross or ECO Publishing." But wait! There's more: "**The only exception is by a reviewer, who may quote short excerpts in a review.**" That sentence is the one that will *hopefully* keep me out of court. I'm one of them there reviewers, so when I write about this here book, I am allowed to quote parts of it if needed. There will be every effort made to paraphrase rather than quote, but there will also be times when only an exact quote will get the job done. Since this is a comparative review, there will be many times I'm quoting both *them* and *me* in the same section. I need to make it as clear as possible to the reader that it is *me* doing the talking—not them. As this will happen often, I will pay myself the same courtesy that I gave them by fully citing myself below:

Repp, R. A. 2021a. Some fun observations of Gophersnakes (*Pituophis catenifer*) near Tucson Arizona—Part 1. Bulletin of the Chicago Herpetological Society 56(4):52-57.

Repp, R. A. 2021b. Some fun observations of Gophersnakes (*Pituophis catenifer*) near Tucson Arizona—Part 2. Bulletin of the Chicago Herpetological Society 56(5):70-83.

And the final laugh in these opening paragraphs of baffling flandickery is that ideally, the reader will have *all three* issues of these articles in front of them. That's right, gentle reader. You can be just like me here—and be reading three different things at once! (Just be glad that you are *not* writing another while you are at it.)

No matter *what* comes off my fingertips in the process of this review, it is *imperative* that the reader knows up front that this book is *outstanding*. It certainly belongs in the prominent place in my personal library that it will occupy, but right now it is *not* on my bookshelf. I received this book on 16 December 2020. It was a special delivery, from Dr. Gordon Schuett. By previous arrangement, we met in Willcox, and he brought *SoA* with him. The book is priceless, and I would have been happy to pay three times its $59.95 cost to have it. Since 16 December 2020, *SoA* has not once made it to my bookshelf. It has remained on top of the "coffee table" (a large cooler topped by a massive truck box), in my study. The book is seldom closed—it is usually open to whatever species account that I am reading at the time. Most herp reading or research I am involved with of late centers around what this book has to say. Whether or not this book meets *all* of my expectations is not important. What *is* important is the *massive* amount of information residing on each and every turn of the page. The *only* rattlesnake account that I have read thus far is the one about Arizona Black Rattlesnakes (*Crotalus cerberus*). The rest of my reading has been about the colubrids of Arizona. No other book has ever even come close to being the repository of information on Arizona's harmless snakes that *Snakes of Arizona* displays. Each and every herpetologist who even *thinks* they like the snakes of the Southwestern United States should own a copy of this book. If you, the reader, are basing your decision of purchasing this book based on what I say—why hell's bells, I'm saying "buy it!"

Before plunging into the actual "comparative review" part of this column, I must first provide a review—as in a rehash—of that which I wrote in Parts 1 and 2. I will do that with brief statements of what was already written, in a sectional format. In Parts 1 and 2, each section, 18 total, carried its own individual title. For clarity's sake, the title of each section will be included below, along with a brief synopsis of what was said in each section. If you are confused, join the club. So am I! Once we

Figure 1. The two subspecies of Gophersnake in Arizona. (Left) Sonoran Gophersnake (*Pituophis catenifer affinis*); (Right) Great Basin Gophersnake (*Pituophis catenifer deserticola*). Images by (Left) Andrew T. Holycross, and (Right) Stephen Barten.

start, we will hopefully establish a rhythm of sorts, and we'll all get into the swing of this together.

1. Playing kissy-face with a Gophersnake: Two different herpers—one of them me—have each suffered a Gophersnake bite to the upper lip area. It was *a lot* funnier to see it happen to somebody else than it was when it happened to me (Repp, 2021a: p. 52).

(Repp, further discussion): Now *why* do you suppose that there is no mention of human lip smacking by Gophersnakes in *SoA*? I scooped them! I want a prize.

2. Let's call them "PICA": I combined the first two letters of *Pituophis,* and the first two letters from *catenifer*, in order to create the word PICA. The words "PICA" and "Gophersnake" were used interchangeably, and often, in Parts 1 *and* 2. After two seconds of consideration to the alternatives, both will be used in this piece as well (Repp, 2021a: p. 53).

Taxonomy: What's in a name? A lot! The first page-and-a-half of the *SoA* Gophersnake species account deals—in scholarly fashion—with the evolution of both the common and Latin nomenclature behind Gophersnakes. According to the first words of this account, in 1835 a Frenchman by the name of Henri Marie Ducrotay de Blainville (*goodness gracious*—how I *love* my own name) first defined PICA as *Coluber catenifer*. In 1853, Baird and Girard sagely took Gophersnakes out of the genus *Coluber*, and placed them right where they belong by naming them *Pituophis catenifer* (Yeah baby—PICA! 168 years of PICA!) Gophersnakes are closely related to Ratsnakes—I guess because they look more like Ratsnakes than Pythons? Good thinking—although the authors don't word it that way. There were then a series of spelling changes and all sorts of word flandickery used by other taxonomists, which only proves that taxonomists have *always* been a fickle lot. They drive me crazy, but that is probably because I am a dumbass who has been numbed by their endless, on-again, off-again long-assed words in a dead language that earned me my first F in high school. That's right—I flagged Latin! Does anybody have a problem with that? In the mix of this indigestible glut of information is what happened with Bullsnakes and Pinesnakes. Bullsnakes became *Pituophis catenifer sayi.* Pinesnakes still carry that god-awful *melanoleucus* species name. The account goes on to describe several subspecies that exist, or at one time existed, and were stricken from the record.

Having cleared all traces of the migraine that all these big words produced, I did walk away with one clear and important notion burned in my brain: There are two subspecies of PICA in Arizona, namely *Pituophis catenifer affinis* (the Sonoran Gophersnake) and *Pituophis catenifer deserticola* (the Great Basin Gophersnake) (Babb et al., 2020; pages 302-303).

(Repp, further discussion): I am not a taxonomist. *I don't want to be a taxonomist*. I just want taxonomists to name something, tell me what that name is, and leave my TV set on *that channel* until my dying day. In other words: "B-a-a-a-a! I'm a sheep!" Just tell me what it is, don't bother telling me why, and *never* change that name. I reserve the right to bitch incessantly if I don't like that name—common *or* otherwise. Where Gophersnakes in Arizona are concerned, if I wanted to abbreviate them to PICAAF and PICADE, I'd be more accurate. But those are *ugly* acronyms. Let's just stick with either PICA or Gophersnakes when describing Arizona snakes. But the two subspecies *do* (at times) have a different visual gestalt (Figure 1). And as the common names imply, one is found in the southern part of the state, sometimes among saguaro cactus, and the other resides in the northern part of the state, sometimes in the Great Basin Desert. If you actually like taxonomy, *Snakes of Arizona* is the book for you. Every account begins like the PICA account—with a staggering but scholarly barrage of taxonomic information. And if you are a *real* taxonomist, you will disagree with much of what is said, and want to squabble about it—simply because that is what taxonomists do. Have at it, guys—disagree with Holycross—be my guest! But in short, with my limited understanding of what the hell these guys are talking about, I give this part of the account a huge thumbs up. They *do* know some amazing stuff about the taxonomy of Arizona's snakes. One more thing: "B-a-a-a-a-a!"

3. Fun with PICA vs. literature about PICA: There was a bit of prophecy at the very start of this section in Part 1: "As the title of this column implies, what I want to do with PICA in this column is to have some fun with them. One thing that is *not* fun

about them is how little there is in the literature about the natural history of the PICA close to Tucson. There is an absolute avalanche of information from California, New Mexico and Texas, but as is the case with nearly *all* colubrids near Tucson, there is next to nothing in the lit about them. Rattlesnakes—yes. Colubrids—no!" (Repp, 2021a: p. 53).

In many ways, this exact thing has happened with PICA in *Snakes of Arizona* as well. Quoting Dr. Holycross, *SoA* is definitely "a synthesis of the literature . . . sprinkled with unpublished observations as we were aware of them." When they synthesized the literature, what else *could* they synthesize other than the literature from other states? There is really not much out there from Arizona. I could really start swinging here—as in throwing punches—but I will reserve that for later. In looking at what I and others had to say in these columns of mine, and trying to cast it all in a positive light, my objective in getting some *great* all-Arizona observations out there in order to augment the Gophersnake account in *Snakes of Arizona* is well-served. And I am pleased and proud to do that in the *Bulletin of the Chicago Herpetological Society*. I am grateful for the opportunity to write to the home crowd. These columns began in June of 2015, so this particular column is my sixth anniversary issue. I hope to be able to bore the piss out of you all for yet another six years!

Getting back on track with my own Section 3, the first mention of the combination of Marty Feldner, Roger Repp, Jim Rorabaugh and Don Swann being dubbed "The Tucson Four" was included in this section. It is good that ***EYE*** mention these names, for ***THEY*** surely didn't. Finally, the upcoming head-to-head comparison between the field observations of the Tucson Four with the Gophersnake account in *Snakes of Arizona* was discussed (Repp, 2021a: p. 53).

4. Three huge Arizona PICAs: Two Gophersnakes from Tucson, and one from the town of Happy Valley (north of Phoenix) that were seven feet long (or longer) were mentioned, along with images of the two from Tucson. It was suggested that the reason for the large size of these three individuals was due to their living in wealthy, semi-urban neighborhoods. Such places have bird feeders and use supplemental watering to keep their quiet streets upscale (Repp, 2021a: p. 54).

Now we will come out swinging!

This author is going to quote the following three sentences, verbatim, on what is said about exceptionally large Gophersnakes in *SoA*'s Gophersnake account: "**Description.** *Pituophis catenifer* is a large-bodied, powerful, constricting colubrid that reaches a maximum TL of 2,743 mm (Ernst and Ernst 2003). The largest snake documented in NM was 2,500 mm TL (Degenhardt et al. 1996). One of us (RDB) has measured two wild-caught AZ *P. catenifer* that were > 2,337 mm TL." (Babb et al., 2020: p. 303).

(Repp, discussion): These three sentences are the only words in this book that pertain to the maximum length of what may very well be the largest snake in the continental United States. As I read these sentences, I first went to my calculator. How long is 2743 mm? It is 8.999 feet—but let's round up and say 9 feet. How long is 2500 mm? The answer is 8 feet, 2.5 inches. And how long is >2337 mm? The answer is >7 feet, 8 inches. The next question I asked at the end of each of these three sentences—my voice rising in ever-increasing agitation as I did, was "where?" Where did this 9-foot-long PICA come from? Where did this 8 foot, 2.5 inch, New Mexico PICA come from, and finally, where were those two >7 foot, 8 inch, Arizona PICA found? Why was there *not* an image of any of these to accompany the text?

While on the subject of photos, there are only four in the Gophersnake account. Of these four, there is only one that I would consider bookworthy. I know that Randy Babb prides himself on taking great photos—rightly so. He is an incredible photographer and artist. Why would he *not* include at least one photo of one of his whoppers? And it only gets worse—but I *promise* that this review of mine is going to bottom out as soon as we are finished with the *totally lackluster* discussion about size of our local PICA. But we have *not* bottomed out yet! Oh no—we're just getting warmed up. Perhaps "heated up" would be a better way to put it?

Getting back to the brief discussion of size in *SoA*, I do not have Ernst and Ernst (2003). Do I need to have every fricking snake book and paper in the world to make *SoA* an informative read? It appears so! I went to Mike Dloogatch for help in getting me a citation and overview of what is said about this *ridiculous* claim of a 9-footer. The following is what Mike had to say about Ernst and Ernst: "The first sentence of the *Pituophis catenifer* account on page 272 in Ernst and Ernst (2003) is: "The somewhat slender gopher snake is a large (TBL to 274.3 cm) cream, yellow, tan, or gray species with 32–106 black, brown, or reddish brown dorsal blotches; a series of lateral dark blotches; 6–36 dark tail bands; four prefrontal scales; and a rounded snout with an enlarged rostral scale on its narrow head." "TBL stands for total body length (snout–vent length + tail length). No source is given for that 274.3 cm maximum." (Mike Dloogatch, pers. comm.)

(Repp, discussion on Ernst and Ernst): We come right out of the block questioning "The somewhat slender gopher snake?" I guess that some might be a tad on the slim side, but I side more with Babb et al. when they say "large bodied, powerful . . . " (Although I ain't exactly feeling kindly *toward* Babb et al. right this second.) The really big ones do indeed have some heft to them. And the fact that the 274.3 cm length is stated so flatly, without any further discourse, has me screaming "*bullshit*" to the world about this here Ernst duo.

But trust me, the totally uninspiring and unenthusiastic amateur hour continues into our next *whopper* of a citation. (That would be "whopper" literally as well as figuratively.) We speak of Degenhardt et al. (1996: p. 295). There we find the following gem: "*Pituophis melanoleucus* may exceed 250 cm and is the longest snake recorded from New Mexico."

(Repp, discussion): Whoa baby—stand back! I wish the authors would have reined themselves in just a little bit more here. There was no need to gush so excessively over this statement. And where did the words "**may** exceed 250 cm" come from? The land of certainty? The land of "take my word for it?" This is *pathetic*! Am I asking for too much here by requesting rough locations, or images, or anything else that might point to facts behind the words of Ernst and Ernst, or Degenhardt, or

Babb et al.? ***We are talking about the biggest snake in the nation here!*** Am I the only person in the world who thinks that is a distinction that makes them very cool? Is that not worth something more than the lackluster descriptions given here in *three accounts*?

It was at this point that I totally exploded with obscenities and vulgar gestures. The wrath of Rog finally culminated with me stepping outside, and *screaming* at the top of my lungs: "***Gophersnakes are the biggest snakes in the Yoooouuuu Esssssss A- A- A- A- A- A-A!***" I do believe that my words were heard all the way to Flagstaff, and as far south as the border town of Nogales. Heck, some of you in Illinois might have heard me. Upon entering the house after this outburst, I came to the sudden realization that five-thirty in the morning on a Sunday might not have been the best timing for a loud freak-out on my part. For the next two hours, police cars cruised up and down my street. My heart would stop each time they slowed down when passing my house. I still expect to hear a knock on my door, perhaps receiving a written invitation to appear in court as a result. The top of this invitation would no doubt contain words of praise such as "Disturbing the peace," or "the use of deadly force with a big mouth." Anyway, I'm calm now. I have deleted the most offensive of that which was written above, and have mostly eliminated the childish hand gestures. But *man* did this part of the book ever ***piss me off*!**

Meanwhile, our own beloved editor, Mike Dloogatch, came through with a game-saving tackle where very large Gophersnakes are concerned. Mike found a Herp Review note entitled "*PITUOPHIS CATENIFER* (Bullsnake). MAXIMUM LENGTH." This very short note suggested that a gentleman named Armin Meier found a whopper PICA in Val Verde County, Texas, that measured 2667 mm (8 feet, 9 inches) total length after being kept and fed in captivity for two years (DeVitt et al., 2007).This individual may very well be the longest snake ever recorded from the United States. We include an image of this magnificent snake here (Figure 2). For whatever reason, Babb et al. (2020) makes no reference to this publication, which is absolutely *perfect* for the size aspect of a large PICA. Shame on them! And shame on *me* for wanting to gloat about it! Scooped them *again*—thanks to Mr. Dloogatch.

Figure 2. Size matters! The gentleman in this image is Armin Meier, who stands 185 cm (6′, 1″) tall. He is displaying a 2667 mm (8′, 9″) total length Bullsnake (*Pituophis catenifer*) collected from Val Verde County, Texas. This magnificent specimen is the longest snake to be documented from the continental United States (DeVitt et al., 2007). Photograph used with permission.

(Repp, further discussion): The very first thing that this author dug deeply into in the *SoA* Gophersnake species account was the large size that Gophersnakes can attain. The effort to get to the bottom of everything mentioned above took me four hours. I carefully read the whole account. I researched the citations given, the culmination of which was me *thankfully* contacting Mike for the information in Ernst and Ernst (2003). Had Mike *not* gone the extra mile with me by finding DeVitt et al. (op. cit.), that entire four hours would have been *completely wasted*. I naturally became mistrustful of every unfamiliar citation presented in the remainder of the species account. That is why you will see me breeze through so many of these citations without further comment. This size thing was very *poorly* handled.

5. Who is eating who? PICA and ground squirrels: I ranted about two species of ground squirrels that Gophersnakes either eat, or are eaten by. A Marty Feldner image of a round-tailed ground squirrel harassing an adult PICA was shown, as were two *excellent* Phillip Brown images of a PICA choking one down via the Tucson Herpetological Society (THS) website (Repp, 2021a: pp. 54-55).

(Repp, further discussion, 22 May 2021): Well, at least for now, it appears that smooth sailing, harmony, peace and trust shall rule this review again. I honestly think we will be okay now—at least until Babb and Holycross get their copy of PICA Part 3. I say, furthermore, that the positive benefits of their going all over the map with PICA observations are many-fold, and will become highly apparent in this Section 5, as well as several other

sections.

The PICA account in *SoA* is *infested* with information about PICA eating ground squirrels, as well as other types of squirrels. The account is *also* infested with the opposite happening. Let's just jump right into it, and find out what it *does* say.

We'll start with the obvious: PICA eating squirrels—ground or otherwise. A direct quote from page 310 of the PICA account is in order here: "In CA, Fitch (1949) found that mammalian prey items by percent . . . weight were: mice 7.8%; *Otospermophilus* spp. (ground squirrels), 44.3% . . . " More! "One of us (RDB) examined a DOR individual (*ca.* 1,828 mm TL) from the Sierra Ancha of central AZ that contained four juvenile *Sciurus arizonensis* (Arizona Gray Squirrel). The young squirrels were presumably taken from their nest, which is typically located in a tree 9.1–18.2 m aboveground (Brown 1984)." I will paraphrase the next observation, written right on the heels of the last one: An ~1 m TL PICA climbed an oak tree to go after a nest containing two young Chiricahua fox squirrels (Kneeland et al., 1995). And finally, the drop-dead awesome Table 1 on pages 308 and 309 of the PICA account lists six species of ground squirrel, along with fox and gray squirrels, as prey items. We will discuss that table more soon.

There's more on PICA eating squirrels, but we now go the other direction. We speak of ground squirrels and "other" squirrels either wantonly killing PICA, or, killing and eating them. Continuing on from page 313 of the PICA account in *SoA*: "Surprisingly, ground squirrels kill a fair number of *P. catenifer*. Several 'badly mangled' and fresh remains of young *P. catenifer* were found on the mounds at the entrance of ground squirrel burrows in CA (Fitch, 1949)." More! "Fitch (1949) speculated that the squirrels killed the small snakes after they sought shelter in the rodents' burrow." More (paraphrased)! Fitch staged an incident between a captive ground squirrel and a young PICA. The miserable, blood thirsty, nasty little thing kept rushing in and biting that PICA until it became immobilized, "at which time the squirrel picked up the snake in its forepaws and bit through the snake's head . . . " (GAAAA. I can't take it anymore!) But MORE! "Fitch (1949) also observed one instance of a clutch of *P. catenifer* eggs destroyed at the mouth of a ground squirrel burrow." (Repp, smartass comment): And here we learn that the nasty little things suck eggs too!

Now let's go for the even bigger and badder squirrel—that miserable, malevolent, merciless merchant of mayhem—the rock squirrel. Also from page 313: "Park Rangers at Carlsbad Caverns, NM, witnessed a battle between a 711 mm TL *P. c. sayi* and an adult *Otospermophilus variegatus* (Rock Squirrel) that lent support to Fitch's observations. When first noticed, both animals were tumbling across the ground, the snake striking at the squirrel's head and the squirrel biting the snake's dorsum. The squirrel soon killed the snake by biting it behind the head (Haywood and Harris. 1971)."

Sticking with Babb et al. (2020), we move into some Arizona observations of this rodent-kills-snake stuff. I paraphrase, and turn loose on the vicious little *jerks*! An adult 1219 mm TL PICA was killed by a rock squirrel on a tennis court (50—love: game, set and match!) The dead snake had small bite wounds that only a squirrel—with those stinking yellowish incisors of theirs—would inflict. Randy Babb also witnessed a 1200 mm total length PICA foraging in a round-tailed ground squirrel colony. The snake soon garnered interest from a group of the stinking little brown terrorists (bastards all), who would squeak their shrill displeasure at the snake as it probed various holes. As soon as the snake would stick its head into a hole, the *nasty* little shittin' things would run up and bite it. The really tragic part of these observations is that the drab little turd-knockers don't seem to realize that their sole purpose in life is to increase snake mass! Somebody *should* explain that to them proper. I say that is up to Randy Babb—as *he* wrote this account. Go and talk to them like a Dutch uncle, Randy!

There are many more observations of ground squirrels, squirrels, and PICA mixing it up in this account. And I also have more that I *would* share if we were short on words and long on time. As we do not have the luxury, we will move on. But this author is definitely becoming more impressed with this species account, as well as this book, as we press onward.

6. PICA ambush postures?: Armed with Marty Feldner's images, as well as my own, I describe what may be lie-and-wait ambush strategies of young Gophersnakes. The observations culminate with a more mature PICA briefly holding a similar posture before plunging into the hole it had staked out. Two young hopper kangaroo rats then jetted out of nearby escape holes, while the snake remained down. For whatever reason, I scared myself away from suggesting that entering a dark hole for a meal might be a spooky endeavor for a young PICA. And the process of fearlessly diving into a tight hole might be a learned behavior (Repp, 2021a: pp. 55-56).

(Repp, discussion): At the point of this writing, I have gone coast-to-coast *twice* in the *SoA* PICA account. I also am ricocheting all over the place throughout the account, making sure that I'm not missing something crucial. The preceding sentence is actually rather lame, as there are literally hundreds of observations that time and space will force me to miss. The more I read this account, the more in awe of it I am becoming. But having said that, there is *nothing* in the account about young PICA holding ambush postures outside of rodent lairs for extended periods of time. (Scooped them again!) The nature of most snake studies is to grab, process, and release. The very notion of standing back and watching anything for a prolonged period of time is foreign to most researchers. But the fact that Marty and I saw a total of four incidents related to this means we were on to something. The ideal situation now would be to witness adult PICA doing the same thing. Whether or not the adults also use ambush tactics, the fact that young PICA do this lie-in-wait ambush stuff certainly merits a peer reviewed note. And yes, these observations *should have been* in *SoA.* Dammit—my words to this effect have been on the THS website since 2002 (Repp, 2002). Did Babb et al. even look at this website? If they did, were their eyes open?

However, I *do* want to use something that I speculated about in the second-to-last sentence of the first paragraph in this section. There has got to be some scary shit inside of these holes! I next want to quote a sentence from page 307 of the PICA account. Before doing so, I want to say that while the

behavior there described is fairly well documented with Pinesnakes and Bullsnakes, I'd bet the farm that it has not yet been specifically defined in PICA from Arizona. Anyway, the quote: "In close quarters like those . . . constructed by rodents, *Pituophis* spp. sometimes subdue their prey by pinning and pressing it against the burrow wall (Fitch 1999)."

Imagine you are a 30-cm-long, 12-gram, *dinky* little PICA. You *know* there is a mamma K-rat with five little pinkie hoppers inside a specific hole, because you can smell 'em in that hole. Do you *really* want to dive into that hole, and throw your 12 grams of mass around in order to push a very angry mamma K-rat (who is easily double your mass), up against a narrow tunnel wall? If she somehow wiggles out of your anemic chokehold, she is going to bite the piss out of you! And there may be any number of other *scary* creatures that might be lurking inside rodent tunnels as well. Sometimes it might be more prudent to wait outside of a tunnel and let the prey come to you. And sometimes, you might starve to death while you are waiting.

7. *Dig this*! An observation of a PICA excavating a hole: Some notes and images of an observation from Don Swann, who witnessed a ~1 meter total length female Gophersnake digging a hole, appeared in this section. Mr. Swann did his Master's work on small mammals of the Sonoran Desert, and it was his opinion (and mine) that this snake was removing a plug created by a nesting rodent (Repp, 2021a: pp. 56-57).

Surprisingly, Don was not the Lone Ranger in describing a PICA observed digging a hole. (But I'll bet that nobody else got photos of it happening, or still has their precious on-site notes of the event in hand.) Add to this the fact that Carpenter (1982), and Fitch (1999, 2006) also felt that a reason for a PICA excavating a hole was to remove a plug that blocked an entrance to a nest containing young, and that Don was *not* aware of the fact that learned others had come to the same conclusion. Four different researchers called that "clearing a plugged nesting hole" shot independently. On page 307 Babb et al. have this to share: "These snakes hunt primarily below ground and are well adapted, with their stout rostrum and powerful neck, to breeching earthen plugs employed by *Geomys* and *Thomamys* spp. (pocket gophers) to close burrows (Carpenter 1982; Fitch 1999, 2006)." More on burrowing from page 315: "*Pituophis catenifer* is adept at digging. Excavation is accomplished by loosening soil with its snout and moving dislodged dirt with coils of the forebody in a scooping motion (Carpenter 1982)." And on page 316 Babb et al. also say this: "In some instances, *P. catenifer* may excavate its own nesting burrows, as has been observed in the closely-related *P. melanoleucus* in NJ (Burger and Zappalorti 1991)."

I could *probably* make some smartass comment about Pinesnakes in New Jersey being called "closely related to Bullsnakes or Gophersnakes," but I think I won't do that. Only a total jerk would imply that this is not a well thought out sentence—and we don't see any jerks *here*—do we?

Part 2, Section 8. Some fun observations of Gophersnakes (*Pituophis catenifer*) near Tucson, Arizona: Your author, AKA "Mr. Shortensweet," came to the realization that he was not only running out of time with Part 2, but had doubled the normal word count of most of his columns. The best solution was to spill over into a Part 3. The importance and reasoning for keeping all observations on PICA within the borders of Arizona was stressed, as was the prediction that the Gophersnake account in *Snakes of Arizona* would not be similarly confined. (The title of the book is *not* Snakes of Texas, or Snakes of California. Where many of the species accounts in this book are concerned, the title of this book should be Snakes of Everywhere.) When this author noted the paucity of reproduction information on PICA in Arizona, he went well beyond the realm of the "Tucson Four" to gather more information. *All* of the information about reproduction in the species occurred a minimum of five years before *Snakes of Arizona* was published. Dammit—why didn't Holycross, Babb or Mitchell get any of them? Finally, at the end of this section, which were the last words of Part 2, I reported having read the *SoA* Gophersnake account for the first time. As this entire Part 3 was to be devoted to comparisons between our discoveries and those of authors Babb et al.—and dozens of other researchers nationwide as well—further discourse was not deemed necessary (Repp, 2021b: pp. 70-71).

(Repp, discussion, start 23 May, end 29 May 2021): I have decided to do the same thing here as I did with Section 8 in Part 2. Other than my traditional signoff, the words that appear at the end of this section will be the last words that I write for this Part 3.

(28 May 2021): I still need to cross a couple of eyes, and dot a couple of tees, but this column is finished enough to start my wrap-up now. I will begin by saying that this is the first book review that I have ever written—and that fact probably shines through. While I have never written a review, I have read a great many—too many. In fact, I have read enough reviews to know that herpetologists ought not to write them. There is something inherently rotten in the nature of a people who think nothing of thumping something as cute and helpless as a white mouse, and gleefully watching it slide down the gullet of a captive snake or lizard. Performing such antics over the course of a lifetime makes it too easy to be tough, and too easy to be hard. Even when we *like* something that has been written by a friend or colleague, we feel we *must* shred that something anyway. The standard review written about a work that we like, written by people whom we like, becomes a shit sandwich. The shit goes in the middle, and the flattery and kindness goes on top and bottom. As hard as I tried *not* to do that here, we still ended up with that shit sandwich. But in this case, I hope the words at least became a shit club sandwich of sorts. And if I didn't put enough bread on the layers of this club sandwich of mine, let me say one last time how in awe I am of this species account and this book. As much as I whined about not being a part of this particular account, I still know that this Gophersnake account is outstanding. I learned so much from reading it that I'm actually ashamed to admit exactly how much I *did* learn. The number one purpose of any such book as this should be to teach, and I was taught!

I have lamented much over not being asked to contribute to this account. It must seem that I am on some sort of ego trip. That is not it at all. I did not personally suffer here. My main concern is that the knowledge of the natural history of Gophersnakes is what suffered—in a book that will stand the test of time for decades to come. If you the reader were to look

Figure 3. An encore image of "Bluto," the *jerk* of a Gophersnake who totally wrecked an opportunity for Jeff Smith and Melissa Amarello to film a mating pair of Gophersnakes in northern Arizona. Note that when this *idiot* of a PICA couldn't find a mating pair to chew on, he just snapped at the air around him. Go play somewhere else Bluto, and *get lost*! Image by Jeff Smith, 29 May 2011.

carefully at the 30,000 or so words I've thrown at you lately, you will see that the best of the observations of PICA natural history are *not* mine. No, where I would have played a pivotal role in this species account was my memory of what others have witnessed and photographed of the natural history of the local PICA, as well as my willingness to go well out of my way to pull these observations together and present them. I have recently had long phone chats with both Randy and Andy, and we all painfully agree. Everything you have read or are about to read would have had a place in this account. The number one example of how hard natural history observations can be to witness can be found on page 316 of the Gophersnake account. Between what Babb and Holycross have to say, and what I have to say, we have exactly one case of full blown coitus. That occurred in **NINETEEN FORTY SIX**! And it only happened because Gloyd dropped a female in a snake bag containing two males! Thanks to Melissa Amarello and Jeff Smith, by way of the Advocates for Snake Preservation's website, we *all* came *very* close to actually witnessing (and filming) a natural wild mating episode with *Pituophis catenifer deserticola* in Northern Arizona (Smith and Amarello, 2011a,b). And just when it was about to happen, a *total asshole* of a male PICA came along and bit his way into a happy situation, wrecking it for snakes and mankind alike. With a one-fingered salute, we bring back "Bluto" for an encore image (Figure 3).

This author was about to burn a thousand horsepower of energy going back in time to mention the first time he met Andrew T. Holycross and Randall D. Babb. I have vivid memories of meeting each of them, and could easily regale you with those memories, including the exact dates and circumstances that we met. But I suddenly remembered that I have two field images that clearly reflect that our associations span more than 20 years. Good enough that is for the likes of this column. The first image (Figure 4 left) was taken on 20 January 1997. Randy, a mutual friend named Karen Galindo, and I herped a series of no-named hills in the Picacho Mountains. We found three Chuckwallas and a *lot* of tortoise scat on this day. The second image (Figure 4 right) reflects the end of a bygone era in my life, when all herpetological hell would break loose on 19 March. The date of this image is 19 March 2000. Andy joined Erika Nowak, Erik Enderson, Steve Zimmerman and me to capitalize on the wonders that March 19 had consistently brought my way. We scored 22 *Crotalus atrox*, a Lyresnake, and a tortoise; Erika found her first-ever wild Gila Monster, and we even crossed paths with a bobcat. These two photos are from the first-ever herping trips we made together. This column will either kill our friendships, or make them stronger. If it winds up being anything but the latter situation, that will be their bad.

As I write these last words about this account, I am looking at the full page picture of Joe Mitchell that appears in the early going of *Snakes of Arizona.* That face looks familiar to me. I do believe that I saw him at several meetings of the Tucson Herpetological Society. How I wish I had followed my first instinct to go shake his hand and introduce myself. Before Dr. Mitchell threw his support behind *Snakes of Arizona*, things were looking

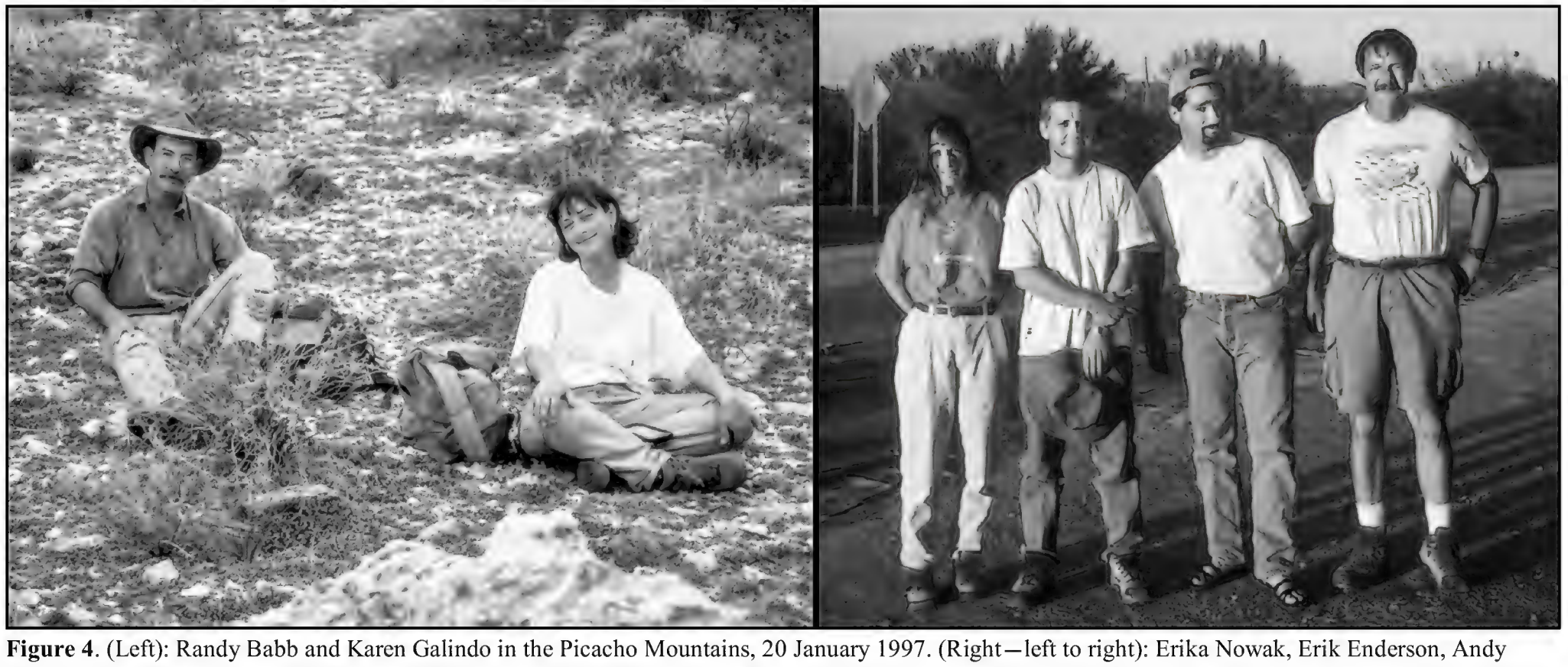


Figure 4. (Left): Randy Babb and Karen Galindo in the Picacho Mountains, 20 January 1997. (Right—left to right): Erika Nowak, Erik Enderson, Andy Holycross, and Roger Repp after a successful outing to the 96 Hills region, Pinal County, Arizona, 19 March 2000. See text for details. Images by (Left) Roger A. Repp and (Right) Steve Zimmerman.

pretty bleak for the book. I had frank discussions many times with several of the account authors, both before and after Joe. Before Joe, *SoA* was a no hope situation. After Joe, there was unbridled optimism. *SoA* still took two forevers to publish, but obviously, the effort eventually succeeded. What a cruel tragedy it was that Joe never got to see the book finished. I just yesterday spoke with Andy about Joe's fatal accident. He had just sent the final edited electronic copy of *Snakes of Arizona* to Andy on 2 July 2019. I won't keep the reader in the dark about his death. It was shortly after sending that copy to Andy that Joe was struck and killed by a truck while walking near his home in Florida. The accident was actually caught on film by a camera on the big rig, and poor Andy actually saw that video. Ouch! It was my pleasure and privilege to work with Joe on this book near the end of 2018. My discussions were simply me firing off images—most of them *not* my own—of incredible photos of feeding, fighting and mating colubrid snakes of numerous species. Some of these observations *did* make it into the book. At one point, Andy told me not to copy Joe any more, as Joe was a busy guy and might not have time. Within seconds of Andy's "back off" email arriving, I got another from Joe. He told me to keep them coming! Almost comically, none of these emails or photos had *anything* to do with Gophersnakes. Where my involvement with the PICA account is concerned, it just wasn't meant to be! A favored quote of Dr. Mitchell's appears at the top of the full-page picture of him: "Life's journey is not to arrive at the grave safely in a well-preserved body, but rather to skid in sideways, totally worn out, shouting 'holy crap, what a ride!'" With a big grin on my face, and tears in my eyes, I have just added my dedication to Dr. Mitchell to this column. Neither *Snakes of Arizona* or this column would have happened without him.

9. PICA, The most encountered colubrid near Tucson: I gathered data from my own 26½-year study, and listed the actual numbers of the five most common snake species encountered. PICA ranked third overall, but two of the more commonly encountered snakes were rattlesnakes (Repp, 2021b: p. 71).

Babb et al. (2020: p. 305) lead off their section about wild PICA encounters with these words: "STATUS AND TRENDS. *Pituophis catenifer* is common throughout much of AZ and is afforded no special protection. No data have been presented to indicate population trends, but it is assumed that *P. catenifer* populations are stable and doing well."

(Repp, discussion): This is where reading this account ahead of writing this review would have proved useful. There is nothing in my Section 9 that deals with population trends in PICA. But I *do* have a spreadsheet that deals specifically with population trends of ten species of snakes. That spreadsheet covers the years 2000 through 2016. Gradual cycles for PICA encounters show up in that 17 years of data. There are a few years of plenty, followed by a few years of gradual plunges, dropping to rock bottom, followed by a few years of rebound, and then a few years of plenty again. We started with 43 PICA encountered in the year 2000. We ended in 2016 with 40 PICA encountered. That's pretty damn stable! However, I expect that the past few years *would have* demonstrated a *dramatic* decline—if I *could have* continued the pace. For the most part, there will be glimmers of the younger Roger Repp in 2017, 2018 and 2019 once that data is entered, but really 2016 was my last gasp at doing what I once did as prolifically as I once did it. I knew this eventuality was coming, and did my best to convince several friends who are 20 years (or more) younger than me to follow in my footsteps. I did my best to get them to start taking notes. That effort was a disappointing bust. Nobody around me is taking field notes—period! There will never be another Roger Repp near Tucson. In ways too many to count, the world does not need another Roger Repp. But having nobody in the valley carrying on with the data-taking is *not* a good thing. Very soon, all we will have left are the Insty-glam and Fecebook herpers.

Most of what follows in Babb et al. (2020) on pages 305 and 306 does not fit neatly into my way of doing things. That is not to say that they did it wrong, or I did it wrong. We're just performing our data collection in different ways. But some of what is presented closely matches my findings. A direct quote from page 305 is in order: "*Pituophis catenifer* was the fifth and seventh most commonly encountered snake during 27 years of road-riding surveys in lower Colorado River and Arizona Upland subdivisions south and west of Phoenix, respectively (Jones et al. 2011b)." More (p. 306): "*Pituophis catenifer* was the third most frequently encountered snake (13.3% of snake captures) in Tobosa (*Hilaria mutica*) grasslands in southeastern AZ (Holycross and Douglas 1996)."

(Repp, discussion): There are many more observations listed on pages 305 and 306, but each seems to approach the numbers game in a slightly different manner. And I am not joking when I say that I quit while I was ahead. ***EYE*** said "third most common," about PICA, and my friend ***Holycross*** said "third most common." In the end, once all of my data is finally compiled, I will be able to closely match my numbers to most of the numbers presented in the PICA account—as well as many other species accounts in *SoA*. More than anything else under discussion in this column, *SoA* has inspired me—in timely fashion—about how best to use my own dataset to match what others in this state are doing.

10. A few words about Dead on Road (DOR) snakes: I mentioned that I include DOR snakes in my counts. They tend to disappear from roads within 24 hours of being killed. Hence, they are good indicators of recent surface activity in any given species. Fifty-five percent of all PICA encountered have been DOR (Repp, 2021b: pp. 71-72).

(Repp, discussion): Unless I completely missed something here (not likely), there is only one *brief* paragraph about DOR PICA in Arizona (or anyplace else, for that matter). A comparative study of DORs on State Route 85 transpired over a 46-year time period. Route 85 is the road into Organ Pipe National Park. It was studied in 1949 (Hensley, 1950), and again around 1996 (Rosen and Lowe, 1996). That information appears on page 305 of the *SoA* PICA species account. To be able to match my observations with what my friend Dr. Rosen discovered would take some serious number crunching on my part. Since I seriously *want* to do this, the day *will* come when I can extract and present my data in a different way, and compare apples to apples with Rosen's landmark road mortality dataset.

11. Activity patterns of PICA: Figure 3 in this section is a

graph representing 629 Gophersnakes found. It depicted peak activity periods in their yearly cycles. PICA were found every month of the year, but May, August and September had the highest number of encounters (Repp, 2021b: p. 72).

Page 315 of the Gophersnake account contains a vast array of somewhat scattered but interesting information about PICA activity patterns across the broad spectrum of their range. All of this information is good to know, but there is simply no way to compare my chart with any of it. The short story is that my graph *belongs* in this species account. Period.

12. PICA are *not* beer snobs: Michael Cardwell was kind enough to furnish images of a Gophersnake with its head thrust into a beer can. He liberated the snake with wire cutters, to find a mouse nest inside the can (Repp, 2021b: Pp. 70 and 72).

From page 306 of the PICA account: "A potentially common source of mortality is discarded beer and soda cans. Cardwell (2009) described a juvenile *P. c. affinis* whose head was stuck in a beer can; it was rescued and released."

(Repp, further discussion): Well I'll be damned! Kudos to Holycross and Babb on this "nice catch!" However, the source of Caldwell's article, the *Sonoran Herpetologist*, has published several other Arizona observations on PICA. Enough said.

13. Packrats and other PICA foodstuffs: I wrote some long but hopefully amusing stories about creatures that might be consumed by Gophersnakes. I relayed a humorous story of a gung ho but foolish little PICA trying to take down an adult Packrat. Other Packrats, ground squirrels, birds and eggs were mentioned. Their ability to climb after prey was discussed. This section ended with wild guesses about a food item in the gut of a PICA, and a bit of wonderment over whether or not their diet included lizards and snakes (Repp, 2021b: pp. 72-74).

(Repp, discussion): Oh, my! I may have at one point thought my columns on PICA were going to be better than the *SoA* account. I am pleased to say that upon zeroing in on the absolute PICA *smorgasbord* presented in this part of the PICA account, any delusions of grandeur are now long gone. If you, the reader, want to know what Gophersnakes out west are eating, buy this book! While it would not be possible for me to tell you every PICA prey item listed, I can certainly summarize some of the more incredible prey items.

But first, there were two interesting coincidences between my own *weak* PICA vs. Packrat observations, and what is in the *SoA* account. We speak of young Packrats (or more properly, white-throated woodrats). I first relayed the now twice-told tale of a long but lanky PICA that crawled into a Packrat midden, and *probably* nailed a youngster. (We heard a squeak, and a female ran out of the midden with two young clinging to her teats.) I also shared an image of two *Crotalus atrox*, a PICA with a food bolus, and yet another mother Packrat with two babies—all confined in a water meter box. I postulated that the prey item inside the PICA was a young Packrat. Babb et al. (2020: p. 310) have this to say about the stomach contents of PICA : "Clark (1968b) found a disproportionate number of young *Neotoma* (woodrats) in the stomachs of *P. catenifer* in NV, suggesting these snakes forage in *Neotoma* nests and that inexperienced young are more susceptible to predation than adults."

(Repp, discussion): Hell yeah—adult Packrats are formidable foes, and only very large or very stupid PICA would want to deal with them. Shifting gears slightly, Joe Mitchell was the third author of the Gophersnake account in *SoA*. His *major* contribution was to prepare a table that gives a fantastic overview of prey items for PICA. This table spans pages 308 and 309, and contains 87 different types of prey! The legend states that "only species near Arizona" are listed. Mitchell also heavily credits the landmark work of Rodríguez-Robles (2002). The table has three columns. The left column presents the scientific names for the prey items consumed, the center lists the common names, and the right shows the source of the observation. I am going to guess that there are about 35 different researchers cited in this table, spanning the years 1934 to 2002. Below I list my choices for the top ten coolest prey items from this table:

(1) Mallard eggs; (2) Eurasian Teal; (3) American Cliff Swallow; (4) Western Screech Owl; (5) Long-tailed Weasel; (6) Black-tailed Jack Rabbit; (7) Couch's Spadefoot Toad; (8) Long-nosed Leopard Lizard; (9) Arizona Black Rattlesnake; (10) Gophersnake.

(Repp, discussion): To coin a term often used in business, "much has been left on the table."

14. On predators and potential predators of PICA: I began with a list of six eyewitness accounts of avian predators of PICA. That list included a golden eagle, red-tailed hawks two times, gray hawks, a roadrunner and ravens. A speculative list included nearly everything from insects, arachnids, other arthropods, more birds (including turkeys), and many mammals, both two-legged and four (Repp, 2021b: pp. 74-75).

(Repp, discussion): Most of what I wrote in this section was highly speculative. I created a list of creatures that I felt were most likely to consume PICA, without even attempting to further research *anything* on that list. Two days after I called Part 2 complete, I suddenly thought of Kingsnakes, Coachwhips, Regal Ring-necked Snakes and Whipsnakes. But it really doesn't matter, as my speculation is not nearly as worthy as the solid observations in the *SoA* PICA species account, which is packed with information on what eats PICA. Below, I will quote or summarize ten cool observations from pages 311 through 314:

(10) "Mortality . . . was highest during the first few weeks of life . . . in excess of 80% of young snakes failed to survive until egress the following season (Fitch 1949)." (9) (on golden eagles) "*Pituophis catenifer* comprised 26 of 28 snakes among 503 prey items taken by 17 nesting pairs in CA (Carnie 1954); most were adult snakes." (8) Eight different studies on red-tailed hawks, ranging from the years 1926 to 1985 state that PICA are frequently preyed upon. (7) An American Kestrel was observed by Jennings (1997) consuming a 350 mm TL PICA. (6) In 1947 Fitch documented a Great Horned Owl with a ca 1000 mm TL PICA in its talons. The bird was unable to clear a barbed wire fence as it attempted to fly away from Fitch, and the PICA was torn from the owl's grasp and left dangling. (5) Roadrunners earn an entire paragraph as potential predators. Sherbrooke and Westfall (2006), reporting on experiments with a captive-reared roadrunner, noted that the killing style of the roadrunner was not

Figure 5. (Left): A loggerhead shrike distracting a young Pacific Gophersnake (*Pituophis c. catenifer*) with a wing display. (Right): When the bird was startled and flew off, photographer Howard Clark moved in and found the snake as shown. See text for details. Images by Howard O. Clark, Jr., 23 September 2011.

altered between PICA and rattlesnakes. They postulated that the roadrunners may not distinguish between venomous and non-venomous snakes. (4) Kapfer and Benell (2005) suggested that seven radio-telemetered *P. c. sayi* (Bullsnakes) were likely preyed upon by coyotes. (3) "Wiseman *et al.* (2019) found *P. catenifer* to be the most common snake consumed by *Lampropeltis californiae* constituting 19% of snakes consumed and 5% of their total diet." (2) Duncan (2003) found a Coachwhip in the process of swallowing a nearly equal sized Gophersnake near Tucson. (1) King et al. (2002) removed a 365-mm TL, 13.9-gram PICA from the stomach of a 159-mm SVL, 441-gram female bullfrog in Yavapai County, Arizona.

(Repp discussion): There was no mention of gray hawks in the Gophersnake species account, so my observation on page 75 of PICA Part 2 was probably a winner of sorts. It's only fair to say (I'm in a forgiving mood) that observation occurred in June of 2020, a little late in the game for inclusion in the PICA account. Forgiving moods can turn on a dime with this author. Once again, Babb et al. missed a most interesting observation published in the *Sonoran Herpetologist.* Had they checked out the THS website, they would have found Howard Clark's observation of a predation attempt by a loggerhead shrike (*Lanius ludovicianus*) on a young PICA. The event happened in San Luis Obispo County, California, on 23 September 2011. Howard first saw the killer songbird flying with the prey item in its beak. The bird dropped it, but returned to retrieve it. Howard was able to get some images of the bird performing a wing display in front of the snake before it flew off. He was then able to quickly process the snake, finding it to be 35.5 cm (14 inches) long and 13 grams in mass (Figure 5). After processing the young PICA, Howard left it as found in hopes that the bird would return to claim its prize (Clark, 2011).

It is time for another temperamental outburst. Many other accounts in *SoA* relied *heavily* on observations that were gleaned from the *Sonoran Herpetologist* (SH). The whole reason for the existence of the Tucson Herpetological Society (THS) was to bring together lay people and scientists alike for the betterment of all. Holycross *and* Mitchell were *very* aware of the potential trove of information to be found in the SH. Randy Babb should have been at least aware of said potential. A few clicks of the mouse could have led him to the THS website. Had he done just that much, he would have been led by the hand to our ambush posture info, Clark's shrike observation just mentioned, and Jim Rorabaugh's image of a pair of Gophersnakes that were supposed to be mating. (They were *not* mating, that was a mistake.) But nevertheless: **C'mon man!**

15. Stuck up Gophersnake, or, There is no such thing as a free lunch in nature: I described, with words and images, a PICA that overestimated its ability to climb a chain fruit cholla. The poor snake was hung out to dry, pierced by the needle-sharp spines of the cactus. A nearby bird nest was likely the impetus for the perilous climb (Repp, 2021b: pp. 75-76).

(Repp, discussion): I thought this observation was so over the top that *surely* nobody else would see anything like it, or even more unlikely, document it. Wrong again, Roger!

Babb et al. (2020: p. 311): "Two incidents of predation on nestling *Campylorhynchus brunneicapillus* (Cactus Wren) by *P. c. affinis* were reported for AZ (Austin *et al.* 1972). In one case the snake (which later died) was found impaled by cholla (*Cylindropuntia* sp.) spines immediately adjacent to a *C. brunneicapillus* nest."

16. On hissing: Any account on the *Pituophis* clade would be remiss if it didn't include hissing. While the local Gophersnakes are certainly capable hissers, they do not often resort to doing so here. Hissing is something that is more prominent in the *Pituophis* clades in the eastern United States (Repp, 2021b: p. 76).

Babb et al. (2020: p. 314): "*Pituophis catenifer* employs two types of defensive sounds: hisses and bellows (Greene 1988; Young *et al.* 1995). Hisses lack frequency and amplitude modulation, while bellows have both. Both hisses and bellows fall between 150 and 600 Hz (the optimum hearing range for snakes) and might play a role in communication among individual snakes (Young 1997)."

(Repp discussion): Uh . . . did he say, no, did they say, uh . . . yes they **did** say that Gophersnakes are using hisses to talk to each other! Does that mean that they can hear too? You know what? I think a man can learn something new every day and *still* die a fool! All I can say about this is **wow!** I sure do hope you are *all* paying attention to these words, because there may be a test later! Every time I suggest that snakes talk to each other, I get the stink eye. I *definitely* need to get my hands on that paper by Young!

17. On longevity, growth rates and sexual maturity: Mention was made of one captive PICA that lived 20+ years. It was suggested that a Gophersnake from Organ Pipe National Park grew to four feet in length in one year. Sexual maturity likely occurs when a PICA reaches one meter snout–vent length (Repp, 2021b: pp. 76-77).

(Repp on longevity): I could find *nothing* on the topic of longevity of PICA in the *SoA* species account—neither in the wild *nor* in captivity. For a brief period of time, I felt my claim of 20+ years was going to be a record of sorts, and I was all proud of myself. But I knew there had to be something more out there, and the emails began to fly. Our beloved editor (Mike Dloogatch, pers. comm.) responded to my inquiry with 33 years and ten months for a *P. c. deserticola* (Snider and Bowler, 1992). Mike also has a *P. c. sayi* (Bullsnake) that he has kept since 1992. My 20-year observation has withered and died, but I *do* have an appreciation of what it takes to even go that long. Bravo, and thank you *again* Mr. Dloogatch.

(Repp, discussion on growth rates): As for growth rates, before I paraphrase what Babb et al. report, I will first say that I *refuse* to go down the endless hole of chasing citations on this topic. I think that perhaps the authors got in a hurry with this section, which is the culmination of the reproduction part of the species account. While some fantastic data is given, there is not *one word* about the localities where these data were obtained. Had the information in this entire chapter remained in Arizona—where it belongs—there may have been less information to work with. But it would be *much* easier for the authors to go into more depth with whatever observations they *did* include. It would also be easier for the reader to draw conclusions. It's time to go outside to scream some more, and I will continue upon my return.

Okay! I'm well again. Anyhow, the information on page 317 of the species account is that somewhere on God's green earth, hatchling Gophersnakes measure 260–550 mm SVL (Degenhardt et al., 1996; Rossi and Rossi, 2003). All remaining growth rates come from that one-man-army Fitch (and I sincerely mean that about the man) in 1949. I assume that means we are speaking of somewhere in California here. Wherever the hell in California that we are talking about, after 20 months, one exceptional individual measured 1002 mm (~3.3 feet). So, this individual snake grew from roughly 400 mm (average hatchling size from Fitch [1949]) to 1002 mm in length during a 20-month time period. Cool. It's *great* to know that one PICA from somewhere in California did this five years before I was born.

On 24 May 2003, at roughly 1400 hours, Dr. Phil Rosen and I blazed past a 120 cm TL DOR Gophersnake. Said dead PICA was exactly at mile marker 237 on Interstate 10. As we noted it, whatever conversation we were having changed to golly gee stories of Gophersnakes that we had dealt with through the years. It was at that point that Rosen told me of this Organ Pipe National Park Gophersnake that he had microchipped that had grown to four feet long in one year's time. I said: "No way, blah blah blah," to which he said: "Yes, way, blah blah blah, to which I inquired: "Really?" To which he responded: "Yes, really." And that, dear reader, is where I got this four-foot-long in one year PICA observation from. It's a Phil Rosen personal communication, verbally relayed at 2 P.M. on 24 May 2003. Whether or not that is documented in writing someplace is above my pay grade to discover.

I will confess that my mention of sexual maturity for female PICA at one meter SVL was pure speculation. Should anybody ever wish to cite me on this statement, the proper way would be: (Repp, 2021b: p. 76, pulled from Repp's posterior). Why do I put *stupid* stuff like that in writing? However, the darker recesses of my backside may *not* have been too far off. Possibly *somewhere* in this great nation of ours, PICA or one of the other *Pituophis* species *does* reach sexual maturity at 1 meter SVL. On pages 315 and 316 *SoA* cites the following for the lengths at which female PICA mature: 90–95 cm SVL (Ernst and Ernst, 2003), and for Nebraska 90 cm SVL (Iverson et al., 2012).

18: Reproduction and/or reproductive behaviors in wild populations of PICA in Arizona: At first, I had a difficult time lining up observations for this section. As a result, I pulled out all the stops, and with the cooperation of many others well beyond the Tucson Four, managed to string together ten Arizona-based reproductive observations. Reproductive events were defined as pairings, combat, courtship, and coitus. The importance of reproduction as an aspect of the natural history of any given animal was stressed. I suggested that all ten observations occurred from late April to early June, and I have seen nothing that indicated a separate mid-summer to fall mating season (Repp, 2021b: pp. 76-82).

(Repp discussion): There is an entire section devoted to reproduction in the Gophersnake account. It appears toward the end. It is very clear to me that everything in the reproduction section was written with haste. *Snakes of Arizona* was nearly 20 years in the making. Deadlines came and went several times during the production of this book. I am guessing that Dr. Holycross was finally given a firm date—a "defecate or get off the pot" deadline. I am convinced that if this final deadline were not met, *somebody* was going to do *something* to kill the entire project—for good! Many of the species accounts had been finished for years—maybe even a decade or more, while others sat in some sort of "almost done" state. I expect that the Gophersnake account was one of these "almost done" accounts. It is likely that somebody, likely Babb, spent some *very* long days and nights on this account. And from what I've heard, that was *not* his fault. A lot of people dropped the ball. They are, after all, herpetologists—people who drop more balls than the wide receivers for the Chicago Bears!

The emboldened word **Reproduction** (with a period after it) appears at the bottom right column of page 315. Following that is a single long paragraph that covers the entire left column of page 316, and continues on to the middle of the right column. I am guessing there are over 500 words without an indentation here. Within those words are 22 citations—*twenty-two* endless rabbit holes of information that may or may not exactly be what the careful reader is even seeking. Let me give you an example of what I am talking about by directly quoting one sentence that is *highly* important to me.

Babb et al. (2020: p. 316): "Courtship occurs in spring following emergence from hibernation and is initiated with a male

following a scent trail laid down by a receptive female (Fitch 1936; Woodbury 1941; Gelbach *et al*. 1972; Parker and Brown 1980; Smith and Iverson 1993)."

(Repp, discussion): Let's *pretend* that I am a highly organized academic herpetologist. (That's probably the funniest thing I've ever said. But please allow me to continue with this particular *preposterous* fantasy, as there is a *reason* for it.) Poof! I am now this highly organized academic herpetologist. I have a highly organized book shelf; I have file drawers packed with highly organized hanging files. And because I am this *sophisticate extraordinaire*, I have a highly organized series of electronic files as well. I'm envisioning it—herpetologically speaking—*I have got the world by the balls*! I have just read the sentence on page 316 of the Gophersnake account on courtship. I really like this sentence, so now I'm going to start tearing books off the bookshelf, papers out of file folders, and fire up my computer while I'm at it. Now I am going to research all five papers that Babb et al. just gave me. Should I get lucky, I will find exactly what I'm seeking, and put everything back in its proper place. *How much time did I just spend?* Hours! Maybe days! And with all that effort, I *still* might not have the answers that I seek. Let's presume something here. Let's presume that the author(s) of the Gophersnake account have all five papers in hand, and have read them all. Could they *not* then explain exactly what they mean by the "*Courtship occurs in spring"* part of their sentence? What is "spring?" Spring might be astronomical spring—March 19 to June 21? Are Bullsnakes following scent trails in Wisconsin on 19 March? Hell no! They're probably still buried under two feet (or more) of snow. Hence, there also needs to be some sort of sliding scale of sorts for when spring actually is. And in order to know *that*, we have to know *where* all five authors are talking about or from. Are all five of these citations dealing with the same place, or are they scattered about some? The latter of course! In short, this otherwise great sentence is rendered *useless* because it becomes a do-it-yourself project. There is no excuse for this. These five papers are right in front of the authors here. (And if they are *not*—they *should be*!) If they see fit to mention something contained in all five pubs, they should minimally go on to give the reader at least the bare minimum information of what those five pubs are saying. If they don't want to do that, they should *not* have mentioned them. And had they stuck with all Arizona observations in the first place, it would not be necessary to cite five different papers from five different places. I still mentally struggle with why the book did not stick to the notion of snakes of Arizona in a book that is entitled *Snakes of Arizona*. ***This is driving me crazy! Is it time to step outside to scream some more?***

I will cover my argument with what was done on reproduction in Part 2 of my columns. Let's pretend that the following was *my* sentence: "Courtship occurs in spring following emergence from hibernation and is initiated with a male following a scent trail laid down by a receptive female." Were that the case, I would simply add (Smith and Amarello, 2011a,b) at the end of the sentence. I would then add the link to the video in the "Literature Cited" section below, and whole nation would know—without further discourse—that "Courtship occurs in spring following emergence from hibernation and is initiated with a male following a scent trail laid down by a receptive female." And by the way, one question to the right person would have led Babb et al. to this video. Enough! But GAAAA!

I am now going to quote two "all Arizona" reproductive observations from Babb et al. (2020) here. They are spectacular. I will list the page number of each at the end of each. Number 1: "On 7 June 1946, Gloyd (1947) collected a 1,828 mm SVL female from Boyce Thompson Arboretum, Pinal Co., and placed it in a cloth bag with two males. He released the snakes in an open area following a commotion in the bag. The larger male promptly began biting the necks and bodies of the female and smaller male. Although the smaller male was deterred, the female appeared indifferent. The larger male then courted the female, working back and forth over her body with his neck and body and biting her on the body and neck. These behaviors resulted in copulation" (p. 316). (Repp, discussion): This is an exquisitely worded paraphrasing of an outstanding observation. And apparently, at least in Arizona, large male PICA are *jerks*. Number 2: "A *P. catenifer* nest found on 9 September 2008 in the San Pedro Riparian Conservation Area (Cochise Co.) contained seven eggs in a circular 20 x 34 cm mammal burrow (C. M. Atkins, A. K. Owens, and T. L. Owens, pers. comm.). One egg was ruptured and another had been ripped open, revealing a live, near-term neonate. Three of the remaining eggs appeared viable and measured 31 x 71 mm, 30 x 65 mm, and 43 x 67 mm" (p. 317). (Repp, discussion): Priceless! I will also add that the Bogert and Roth (1966) PICA combat paper is also mentioned in Babb et al. (2020) Fine minds think alike at last? Not really! Babb et al. pulled an egregious boner by suggesting that the combat incident described occurred in "the San Bernardino Valley." (*Groan*!) The combat event described by Bogert and Roth happened in the town of Portal, Arizona, which is in the San Simon Valley.

Now that I have bitched *relentlessly* about all the non-Arizona observations of Gophersnakes and their ilk in *Snakes of Arizona*, I will highlight one paragraph from Babb et al. (2020: p. 316) about Pinesnakes from New Jersey. A direct quote is in order: "Up to five females were observed to use the same nesting burrow, and they often returned to the same burrow to re-excavate it for nesting in following years (Leszcynski and Zappalorti 1996). A *P. melanoleucus* marked as a hatchling returned after six years to deposit her clutch of eggs in the burrow where she was born (Leszcynski and Zappalorti 1996)." How very cool is *that*? And while we're at it, I am going to include an image of a Bullsnake from Iowa, and a Pinesnake reproductive event from North Carolina (Figure 6). In my opinion, images like these should have appeared in *SoA* as well. If you're going to write about them, show us some images of them! I've scooped them again!

We are now bringing this epic series of columns to a close. As suggested earlier, my final words will appear in Section 8 above. But for here—this part of the end of the column—what I want to make clear is how great it would be if somebody were to do a full blown *natural history* radio-telemetry study on PICA near Tucson, Arizona. Were I physically capable of carrying out such a study I'd do it in a heartbeat. I have the money, I have the time, and I *know* I would do it right. What I don't have is a strong back. I guess what I'm saying is "I would if I could but I

Figure 6. Since there is much discussion about Bullsnakes and Pinesnakes in the Gophersnake account in *Snakes of Arizona*, we show an image of each. (Left): A Bullsnake (*Pituophis catenifer sayi*) from Iowa. Image by Mike Pingleton. (Right): Copulating Northern Pinesnakes (*Pituophis m. melanoleucus*) from North Carolina. Image by Jeff Beane, 25 May 2019. Note that the male is biting the female, which appears to be a common mating behavior among the entire clade of *Pituophis*.

can't so I won't." Sadly, neither will anybody else.

I would like to end by offering one more quote from page 317 of the PICA species account. I'm sure the reader will agree it is a *very* cool quote: "The Seri Indian word for *P. catenifer* is *cocaznaacol*, which translates to 'thinks it is a rattlesnake' (Grismer 2002)." Perhaps it's time for *me* to meddle in taxonomy. After all, I've seen over 600 Gophersnakes in my life. But I have *never* seen a gopher! Perhaps we should follow the example of the Seri, and change the Latin name of PICA to *Mimicus crotalus*. That's *pure* genius at work. And to think that I flunked Latin? *Mimicus crotalus*? EYE *LIKE IT*!

This here is Roger Repp, signing off from Southern Arizona, where the turtles are strong, the snakes are handsome, and the lizards are above average.

Literature Cited*

Babb, R., V. Boyarski and J. Mitchell. 2020. *Pituophis catenifer* Gophersnake. Pp. 302-317. *In*: A. C. Holycross and J. T. Mitchell, editors, Snakes of Arizona. Rodeo, New Mexico: ECO Publishing.

Bogert, C. M., and V. D. Roth. 1966. Ritualistic combat of male gopher snakes *Pituophis melanoleucus affinis* (Reptilia, Colubridae). American Museum Novitates 2245.

Cardwell, M. 2009. Trap hazard posed by beverage cans to desert snakes. Sonoran Herpetologist 22(5):52.

Carpenter, C. C. 1982. The bullsnake as an excavator. Journal of Herpetology 16(4):394-401.

Clark, H. O., Jr. 2011. Loggerhead Shrike (*Lanius ludovicianus*) predation on a Pacific Gopher Snake (*Pituophis catenifer catenifer*). Sonoran Herpetologist 24(11):117-118.

Degenhardt, W. G., C. W. Painter and A. H. Price. 1996. Amphibians and reptiles of New Mexico. Albuquerque: University of New Mexico Press.

DeVitt, T., B. I. Crother, A. Meier, F. Burbrink and J. Boundy. 2007. *Pituophis catenifer* (Bullsnake) Maximum length. Herpetological Review 38(2):208-209.

Duncan, R. B. 2003. *Masticophis flagellum* (Coachwhip). Prey. Herpetological Review 34(4):376.

Ernst, C. H., and E. M. Ernst. 2003. Snakes of the United States and Canada. Washington, D.C.: Smithsonian Books.

Fitch, H. S. 1947. Predation by owls in the Sierran foothills of California. Condor 49(4):137-151.

————. 1949. Study of snake populations in central California. The American Midland Naturalist 41(3):513-579.

————. 1999. A Kansas snake community: Composition and changes over 50 years. Malabar, Florida: Krieger Publishing Company.

————. 2006. Gopher snakes, bullsnakes and pine snakes. Journal of Kansas Herpetology (17):16-17.

Hensley, M. M. 1950. Results of a herpetological reconnaissance in extreme southwestern Arizona and adjacent Sonora, with a description of a new subspecies of the Sonoran whipsnake, *Masticophis bilineatus*. Transactions of the Kansas Academy of Science 53(2):270-288.

Holycross, A. C., and J. T. Mitchell, editors. 2020. Snakes of Arizona. Rodeo, New Mexico: ECO Publishing. 836 pp.

Iverson, J. B., C. A. Young, T. S. B. Akre and C. M. Griffiths. 2012. Reproduction by female bullsnakes (*Pituophis catenifer sayi*) in the Nebraska Sandhills. The Southwestern Naturalist 57(1):58-73.

Jennings, M. R. 1997. *Pituophis melanoleucus annectans* (San Diego gopher snake) and *Masticophis lateralis lateralis* (California striped racer). Predation. Herpetological Review 28(4):205-206.

Kapfer, J. M., and C. T. Benell. 2005. *Pituophis catenifer sayi* (Bullsnake). Predation. Herpetological Review 36(3):326.

King, K. A., J. C. Rorabaugh and J. A. Humphrey. 2002. *Rana catesbeiana* (Bullfrog). Diet. Herpetological Review 33(2):130-131.

Kneeland, M. C., J. L. Koprowski and M. C. Corse. 1995. Potential predators of Chiricahua fox squirrels (*Sciurus nayaritensis chiricahuae*). The Southwestern Naturalist 40(3):340-342.

Repp, R. A. 2002. Gophersnake account. Tucson Herpetological Society website. <https://tucsonherpsociety.org/amphibians-reptiles/snakes/gophersnake/>

————. 2021a. Some fun observations of Gophersnakes (*Pituophis catenifer*) near Tucson Arizona—Part 1. Bulletin of the Chicago Herpetological Society 56(4):52-57.

————. 2021b. Some fun observations of Gophersnakes (*Pituophis catenifer*) near Tucson Arizona—Part 2. Bulletin of the Chicago Herpetological Society 56(5):70-83

Rodriguez-Robles, J. A. 2002. Feeding ecology of North American gopher snakes (*Pituophis catenifer*, Colubridae). Biological Journal of the Linnean Society 77(2):165-183.

Rosen, P. C., and C. H. Lowe. 1996. Ecology of the amphibians and reptiles at Organ Pipe Cactus National Monument, Arizona. National Biological Service, Cooperative Park Studies Unit, School of Renewable Natural Resources, The University of Arizona, Technical Report No. 53.

Rossi, J. V., and R. Rossi. 2003. Snakes of the United States and Canada: Natural history and care in captivity. Malabar, Florida: Krieger Publishing Company.

Sherbrooke, W. C., and M. F. Westphal. 2006. Responses of greater roadrunners during attacks on sympatric venomous and nonvenomous snakes. The Southwestern Naturalist 51(1):41-47.

Smith, J., and M. Amarello. 2011a. Ménage à trois (part 1). Advocates for Snake Preservation website. <https://www.snakes.ngo/menage-a-trois-part-1>.

Smith, J., and M. Amarello. 2011b. Ménage à trois (part 2). Advocates for Snake Preservation website. <https://www.snakes.ngo/menage-a-trois-part-2>

Snider, A. T., and J. K. Bowler. 1992. Longevity of reptiles and amphibians in North American collections, second edition. SSAR Herpetological Circular 21.

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* This Literature Cited does not include entries for text citations that appear only in direct quotations.

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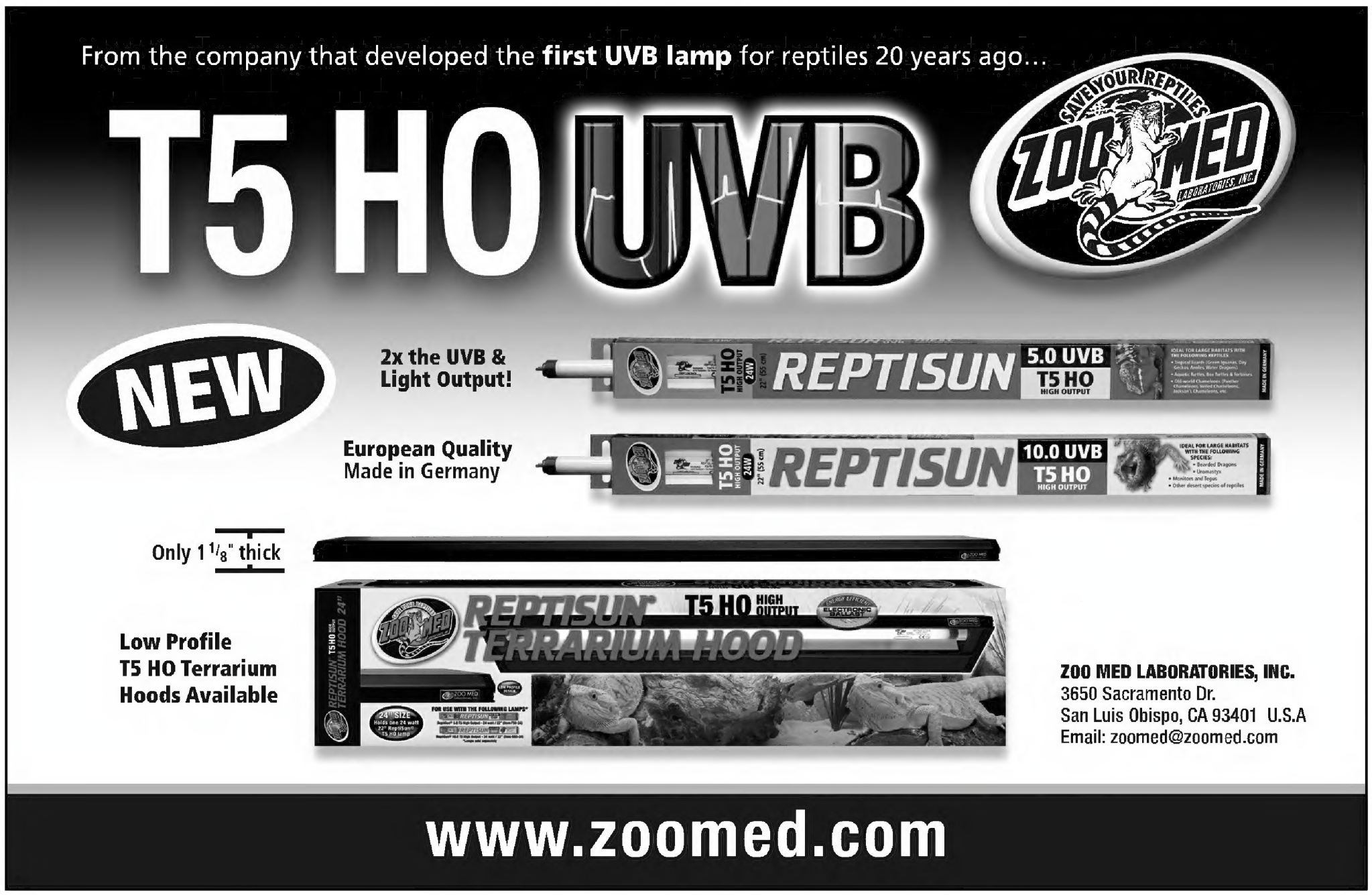
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UPCOMING MEETINGS

Until in-person meetings again become possible the Chicago Herpetological Society will be holding monthly general meetings online via Zoom webinar. A notification will be sent by email to all members who have supplied us with an email address. As has been our custom for over 50 years, the meetings will be held on the last Wednesday evening of each month. The June 30 webinar will be **Show & Tell**. The speakers will be you, the members of the Chicago Herpetological Society.

A speaker for the July 28 meeting has not yet been confirmed.

Please check the CHS website or Facebook page each month for information on the program. Information about attending a Zoom webinar can be found here:
<https://support.zoom.us/hc/en-us/articles/115004954946-Joining-and-participating-in-a-webinar-attendee->

Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? The next board meeting will be held online. If you wish to take part, please email: mdloogatch@chicagoherp.org.

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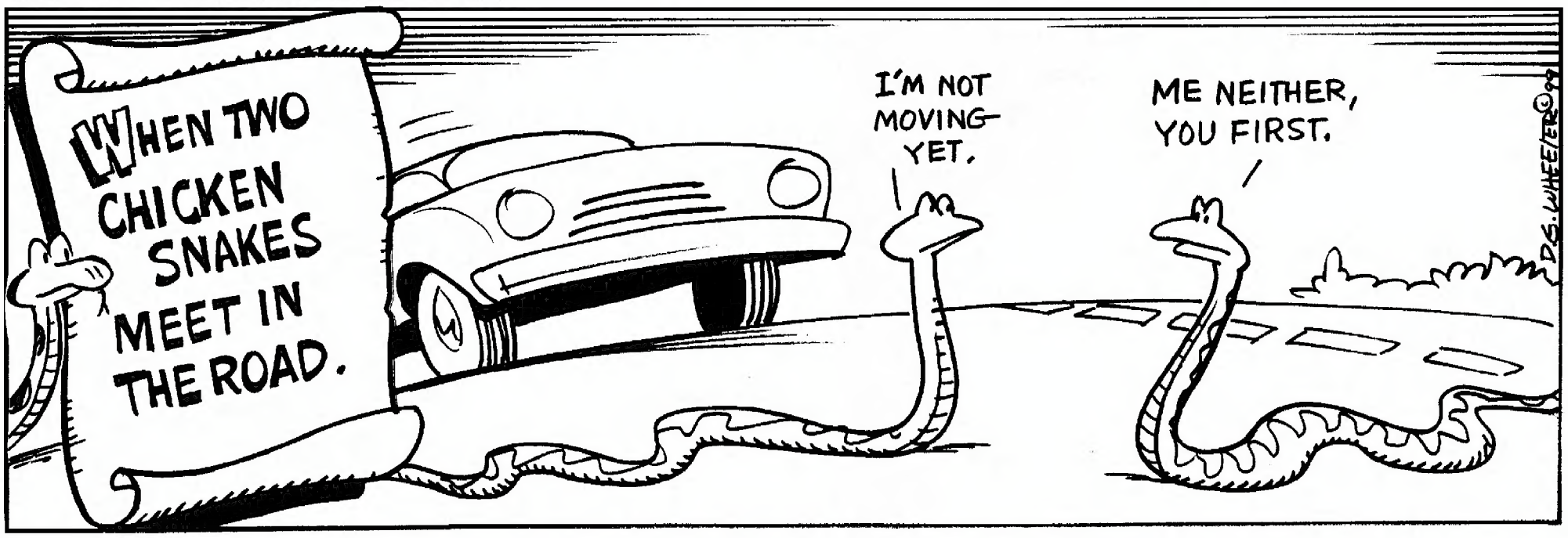

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